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EFFECT OF SIZE OF STIMULUS ON SIZE AND SHAPE OF COLOR FIELDS.

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BRYN MAWR, PA.

Color fields were charted under fixed conditions of illumination, background, preexposure of the eye and standard colors, the stimulus in the different tests varying in size, so as to subtend angles of 2, 1, 0.5, and 0.17 degrees. It is found the size of the stimulus comes next in importance to its intensity in determining the boundary of the field. For red and blue the large stimulus carried boundary almost to that of the field of vision. The effect of size of stimulus and other variable factors is greater for pathologic than for normal eyes, and varies for different colors.

In previous papers[1] we have shown the effect of intensity of stimulus and of brightness of preexposure and surrounding field on the size and shape of the color fields. It will be the purpose of the present paper to show the effect of *size* or *area* of stimulus on the size and shape of the color fields.

Three possibilities may be noted as to the effect of increase in the size of the stimulus on the response of a sense organ. (1) There is an increase in the total energy of excitation in direct proportion to the increase in the size of the stimulus. If it be conceived that the receptors act collectively one might expect an increase in the response of

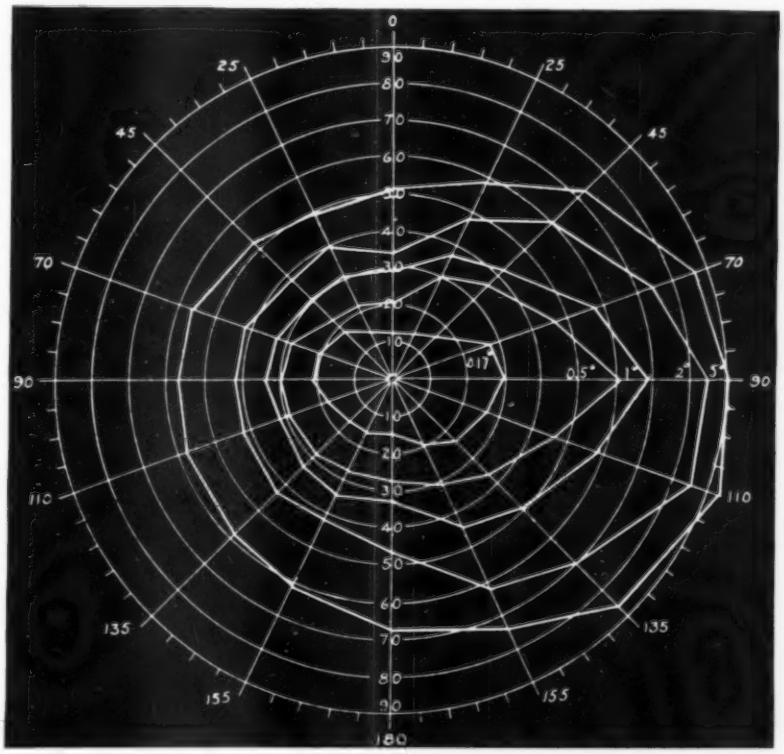

Fig. 1. Effect of size of stimulus on field for red. In this and Fig. 2 and Fig. 3 preexposure and surrounding field of grey were of same brightness as color at limits of sensitivity.

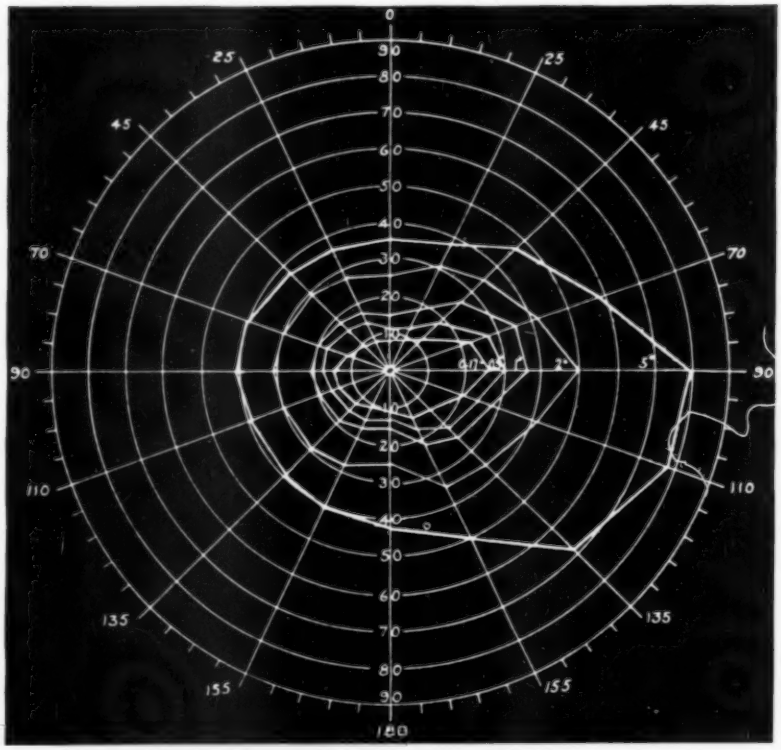

Fig. 2. Effect of size of stimulus on fields for green.

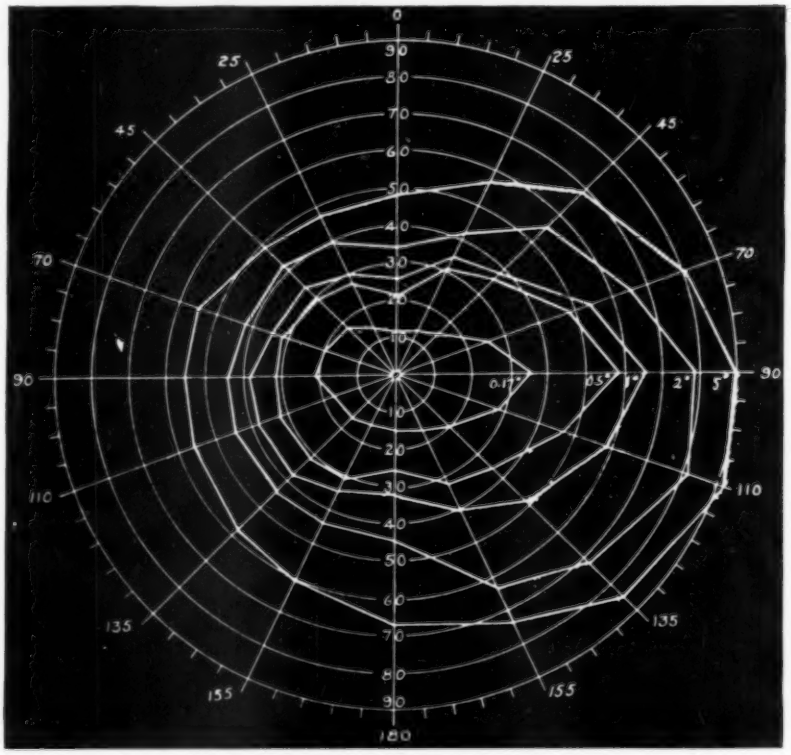

Fig. 3. Effect of size of stimulus of fields for blue.

the sense organ in direct proportion to the increase in the area of the stimulus, provided that the receptors included in the area stimulated are equally sensitive.

(2) If on the other hand it be conceived that the receptors act independently it might be expected that the intensity per unit area of stimulus, not the total intensity, would be the effective factor in determining the response of the sense organs. In this case increase of area would not increase the power of the stimulus to arouse a response in the sense organ.

(3) A third view would be that increase of area is effective in arousing the response of the sense organ but that this effect is not in direct proportion to the increase of area. In a somewhat extensive study of the response of the retina made in a number of studies, we have found this latter view to be correct within limits. That is, within a certain range of change, an increase of size of stimulus increases the response of the sense organ, but apparently not in direct proportion to the change in size. Even if the first view as stated above correctly represents the law of response of nervous structures, the conditions for its fulfillment would not be found in the retina. That is, it presupposes a uniform distribution of sensitivity over the receiving surface. Uniform sensitivity occurs over very limited areas in the retina.

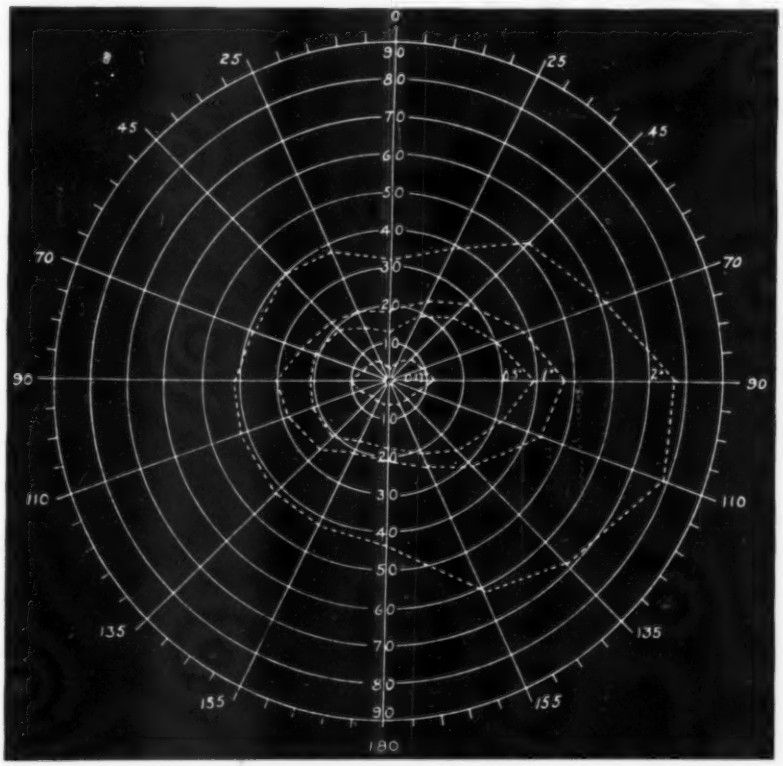

Fig. 4. Effect of size of stimulus on fields for red. For these and Fig. 5 and Fig. 6 white preexposure and surrounding field.

Next to intensity, size of stimulus is the most powerful of the extraneous factors influencing determinations of the size and shape of the color fields. Three reasons may be mentioned why the perimetrist should be thoroly familiar with this influence for all of the conditions under which it may occur. (1) Reproducibility of result can not be expected without careful control of size of stimulus. (2) No result obtained with any given size of

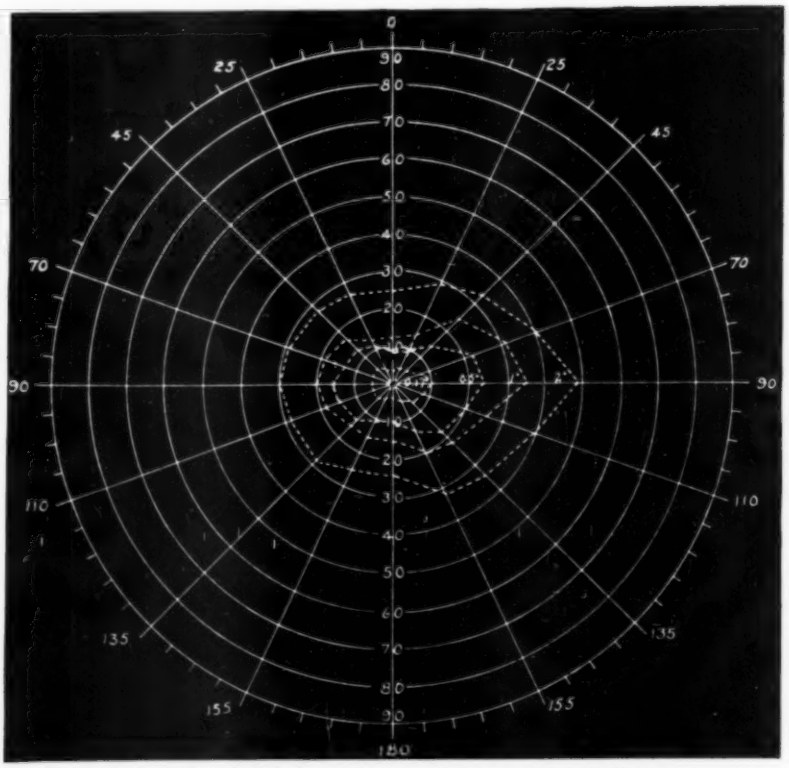

Fig. 5. Effect of size of stimulus on fields for green. See Fig. 4.

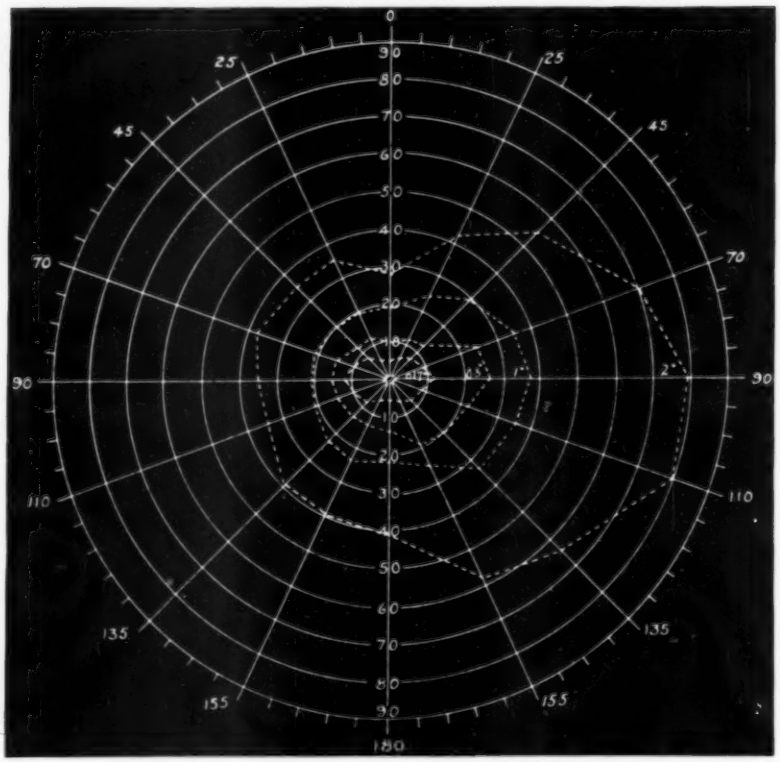

Fig. 6. Effect of size of stimulus on fields for blue. See Fig. 4.

stimulus can be correctly interpreted without a knowledge of the effect of size of stimulus and of the range of variation that may be expected for nonpathologic cases with that size of stimulus. And (3) the effect of size of stimulus is greater on the size and shape of pathologic than of nonpathologic fields, *i. e.*, the pathologic field is narrowed more by the use of small stimuli than the nonpathologic field. Advantage of this fact can be taken to increase the diagnostic sensitivity in the determination of the form and color fields. Diagnostic sensitivity can be increased also by decreasing the intensity of the stimulus thru decrease of intensity of illumination, decrease of coefficient of reflection of the test object, etc., but these means are not as feasible and do not present as satisfactory working conditions as decreasing the size of the stimulus. The bearing of these points on diagnostic sensitivity will be made the subject of a later paper. It may be stated here, however, as a general principle or law of diagnosis that *any factor which decreases the response of the retina to light or color narrows the fields more for pathologic than for nonpathologic cases.* Thus in forming a diagnostic scale the amount of overlap between these two types of cases can be reduced or entirely eliminated perhaps by the use of conditions (small stimuli, low intensities, etc.) which narrow the fields. It follows also from this law that either the difference or the ratio of size of field for two sizes or two intensities of stimulus can be used as the basis of differentiation between pathologic and nonpathologic cases. A scale based on the value of this difference or this ratio would doubtless have a narrower range and involve less overlap between pathologic and nonpathologic cases than one based on the results obtained from a single size or intensity of stimulus. That is, many of

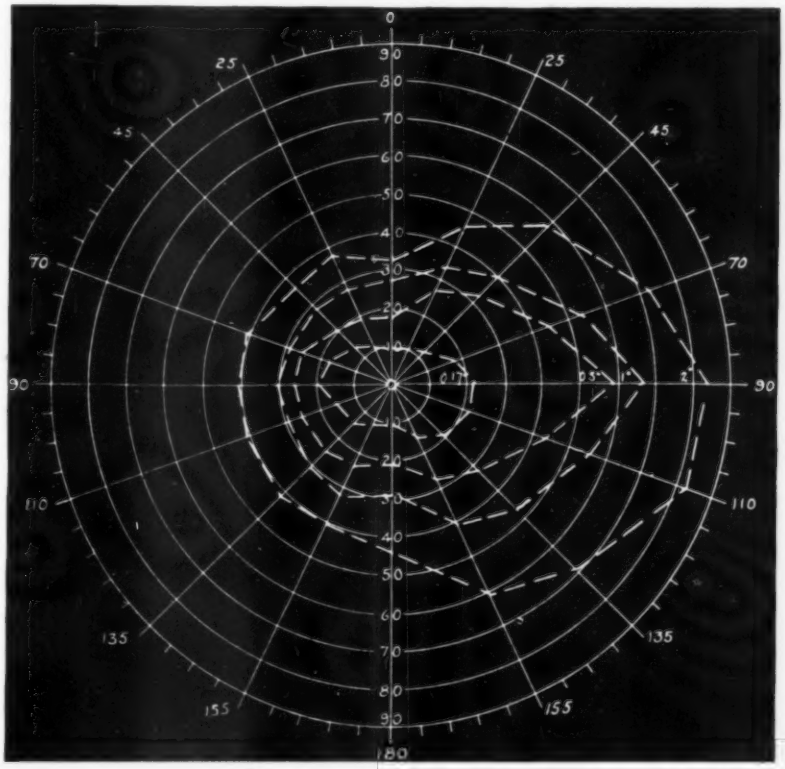

Fig. 7. Effect of size of stimulus on fields for red. Black preexposure and surroundings field for this and Figs. 8 and 9.

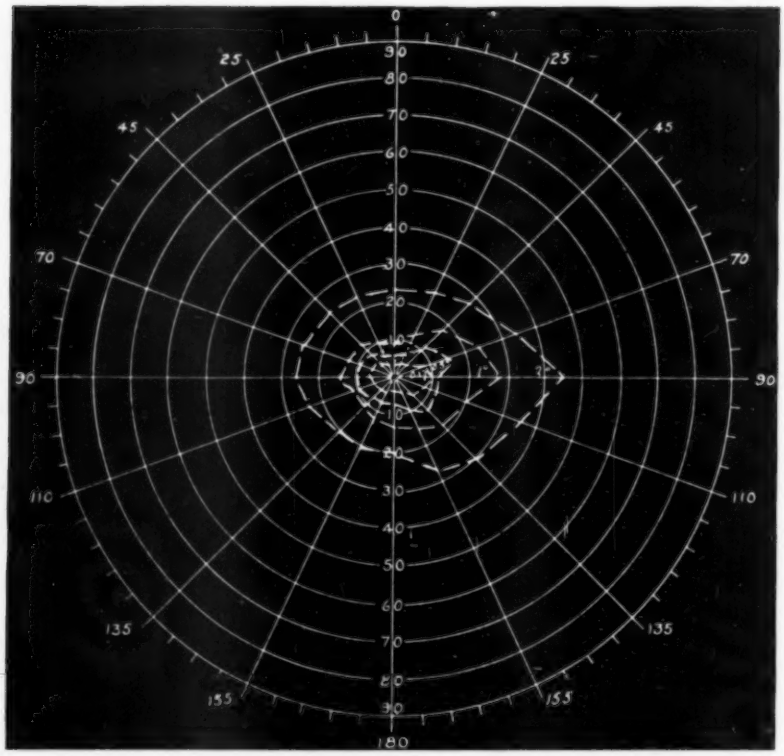

Fig. 8. Effect of size of stimulus on fields for green. See Fig. 7.

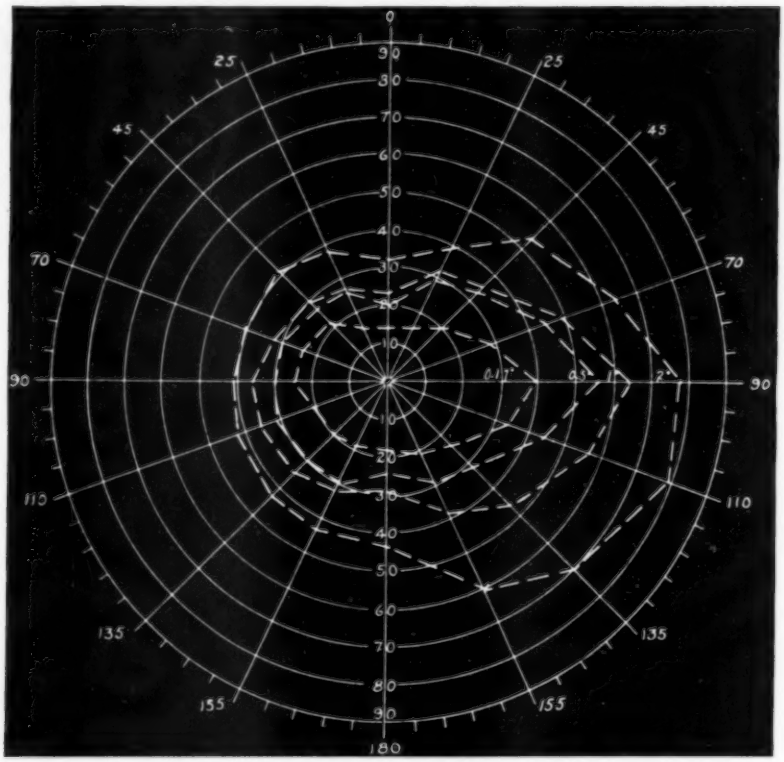

Fig. 9. Effect of size of stimulus on fields for blue. See Fig. 7.

the variable factors which influence the scatter of results from individual to individual[2] in the latter cases (age, refractive condition, shape of face, size of pupil, curvature of cornea, sensitivity of retina, etc.) would not affect the difference or the ratio of result obtained with two sizes or intensities of stimulus. It further seems probable from our results on the effect of increase of size of stimulus on extent of field that two sizes may be found which gave uniformly no difference in result for nonpathologic but do give a difference for pathologic cases. For example, the smaller of two stimuli both of which give the maximum breadth of field for the nonpathologic may produce a cut in the field for the pathologic cases. Because of the smaller size of stimulus required to give the maximum breadth of field, this procedure could doubtless be more conveniently worked out for the form than for the color fields.

It is the purpose of the present paper to show only in a general way the magnitude of the effect of size of stimulus on the limits of sensitivity when all of the other factors are subjected to careful control. In former papers we have shown that the color fields for red and blue can be made coextensive with the limits of the field of vision if a sufficiently intensive stimulus be used. One of the points included in this study has been to find out whether the same result can be obtained by increasing the area of a stimulus of good but not of excessive intensity.

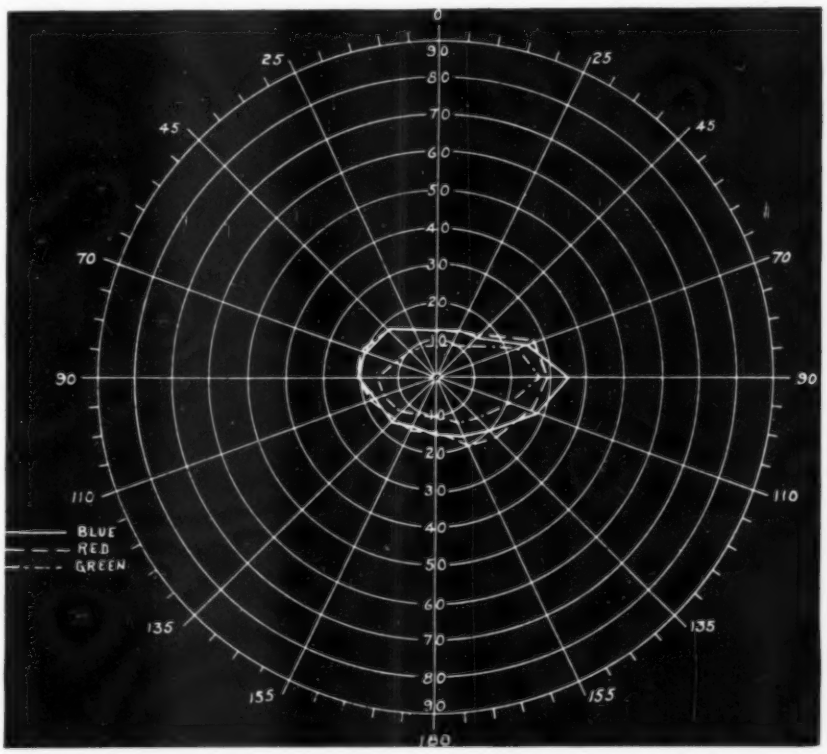

Fig. 10. Fields for red, green and blue for stimuli subtending a visual angle of 0.17 degrees. Preexposure and surrounding field of gray of brightness of stimulus at limits of sensitivity.

CONDITIONS UNDER WHICH THE WORK WAS DONE.

The determinations were made with the Ferree-Rand perimeter. The illumination of the perimeter arm was kept constant at 7 ft. c. Three brightness values were used as preexposure and surrounding field,—a white, black, and

a gray of the brightness of the color at or near the point at which the limits of sensitivity occur. The brightness value of the white at the intensity of illumination employed was 0.01367 cp. per sq. in.; of the black, 0.000567 cp. per sq. in. The grays needed to match the colors in brightness were selected from the Hering series of pigment grays in which white is represented by number 1 and black by number 50. Inasmuch as the colors change their brightness when imaged at different degrees of eccentricity from the fovea, and the different sizes of stimulus carried the limits to different degrees of eccentricity in the peripheral field, different grays were required to match the different sizes of stimuli at the limits of sensitivity. In some cases also these grays varied for the different meridians for the same color. The serial number of these grays, also their brightness in candle power per square inch under the intensity of illumination used, are given in Table I. The stimuli used were a red, green and blue of the Heidelberg series of pigment papers. The sizes employed subtended a visual angle at the eye of 2, 1, 0.5 and 0.17 deg. respectively.

As stated above, an attempt was made to find out whether the color fields could be made coextensive with the field of vision by increasing the area of stimuli of good but not excessive intensity. For this work only the gray preexposure and surrounding field was used. Various sizes of stimulus were investigated for each color. It was found that an increase in the visual angle subtended by the colored stimulus up to 5 deg. widened the limits of sensitivity to that color. An increase beyond this size widened the limits only in case the limit is defined as the angular separation of the center of the stimulus from the fovea and then only by the amount which is some approximation of half the visual

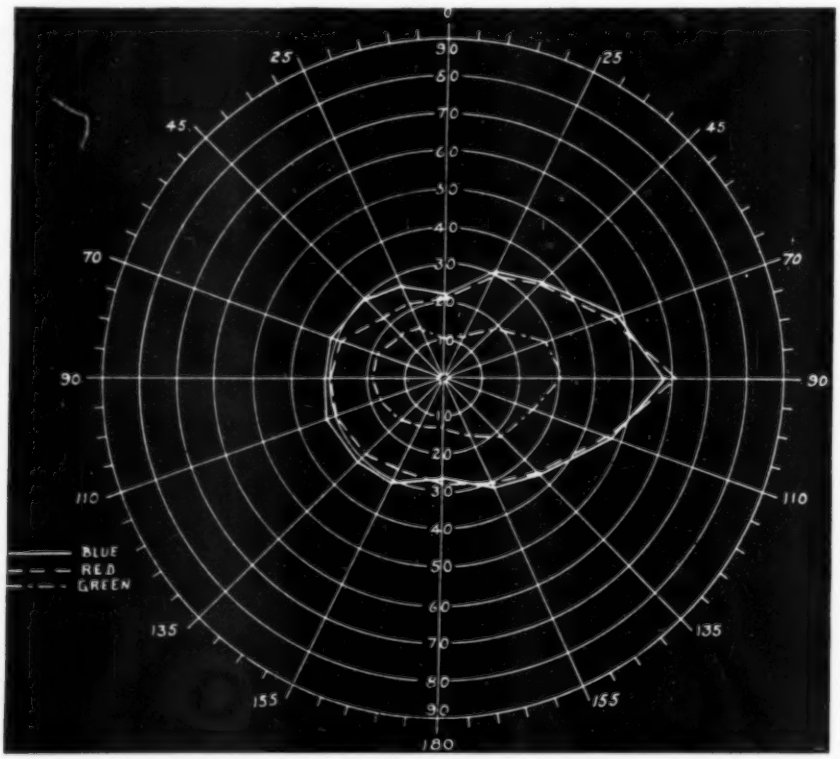

Fig. 11. Fields for red, green and blue for stimuli subtending a visual angle of 0.5 degrees. Preexposure and surrounding field of grey of brightness of color at limits of sensitivity.

angle subtended by the stimulus. The limits of sensitivity were therefore determined for this optimum size of stimulus, 5 deg., in order to show the widest fields that could be obtained for our observer by increasing the area for the intensity of stimulus employed. For comparison the form field for a 1 deg. white stimulus on a black background was also determined.

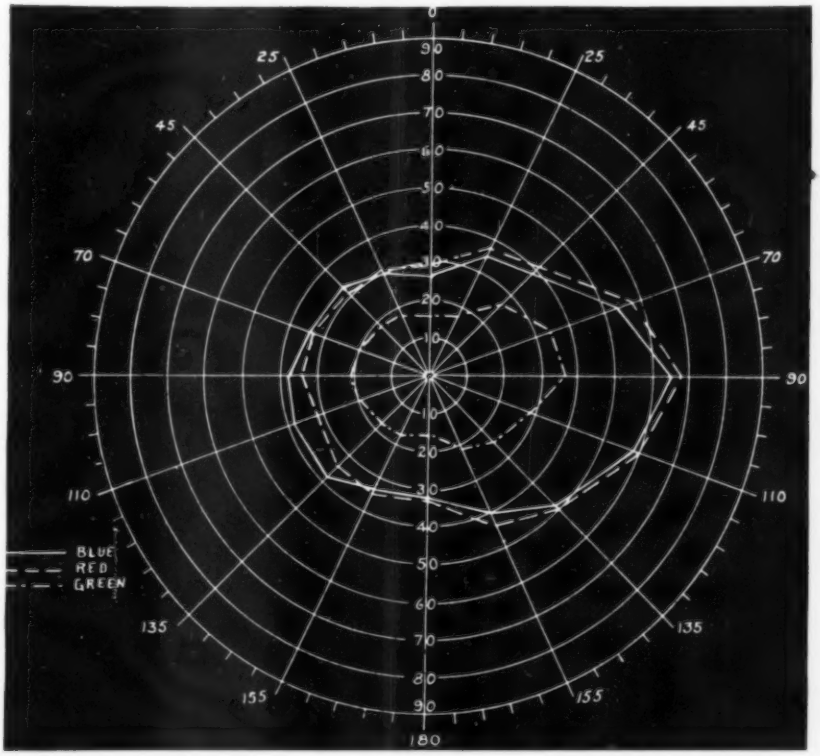

Fig. 12. Fields for red, green and blue for stimuli subtending a visual angle of 1 degree. Preexposure and surrounding field of gray of brightness of color at limits of sensitivity.

In specifying the limits of sensitivity for stimuli of different area, two methods may be employed.[3] (1) The usual method may be followed of specifying the limit by the angular separation between the fovea and the center of the stimulus when it is placed at the point at which all trace of its original quality is lost. Or (2) the limit may be defined as the angular separation between the fovea and the inner edge of the stimulus when it is placed at the point at which all trace of its original quality is lost. The degrees of eccentricity given by the two methods differ then by one-half the visual angle subtended by the stimulus. In this paper we have specified the limits of sensitivity in accordance with the first of the above mentioned methods. The difference for the methods would be negligible for our results in case of the stimuli subtending visual angles of 0.17, 0.5 and 1 deg. For the stimuli subtending visual angles of 2 and 5 deg., the limits are wider by 1 and 2.5 deg. respectively as we have specified them than they would be by the second method.

RESULTS.

The results obtained are shown in Tables II-IV and Figs. 1-14.

A precise way of making a quantitative comparison of fields for the sake of determining numerically the exact effect of any given factor, is to measure the areas of the fields plotted to a standard scale and determine the relations of these areas. The measure-

ments can be made most conveniently by means of a planimeter. The perimetrist will find this instrument of great value and convenience in compiling and interpreting his results. We have measured the areas of the fields shown in Figs. 1-14 when plotted to a scale of 1 mm. to 1 deg. of visual angle, and have determined in per cent the amount the field has been changed by each of the sizes of stimulus for the three conditions of preexposure and surrounding field, using the area of the field determined with the 2 deg. stimulus as the base on which to compute the percentage change. In Table II are given the area of the fields in sq. cm. when plotted to a scale of 1 mm. to 1 deg. for the different sizes of stimuli for the different preexposures and surrounding fields. In Table III are shown in percent the reductions in area of the color fields for stimuli of respectively 1 deg., 0.5 deg. and 0.17 deg. as compared with a stimulus of 2 deg. In Table IV a comparison is made of the area of field for the three colors with a 5 deg. stimulus with that of the form field (white on black) with a 1 deg. stimulus.

In Figs. 1-3 are shown the fields for each color for all sizes of stimulus used for the gray preexposure and surrounding field; in Figs. 4-6 for the black preexposure and surrounding field; and in Figs. 7-9 for the white preexposure and surrounding fields. In Figs. 10-13 are shown the fields for the three colors taken respectively with 2, 1, 0.5 and 0.17 deg. stimuli with preexposure and surrounding field in every case of the gray of the brightness of the color; and in Fig. 14, the fields for the three colors with a 5 deg. stimulus (gray preexposure and surrounding field) and for the form field (white on black) with a 1 deg. stimulus.

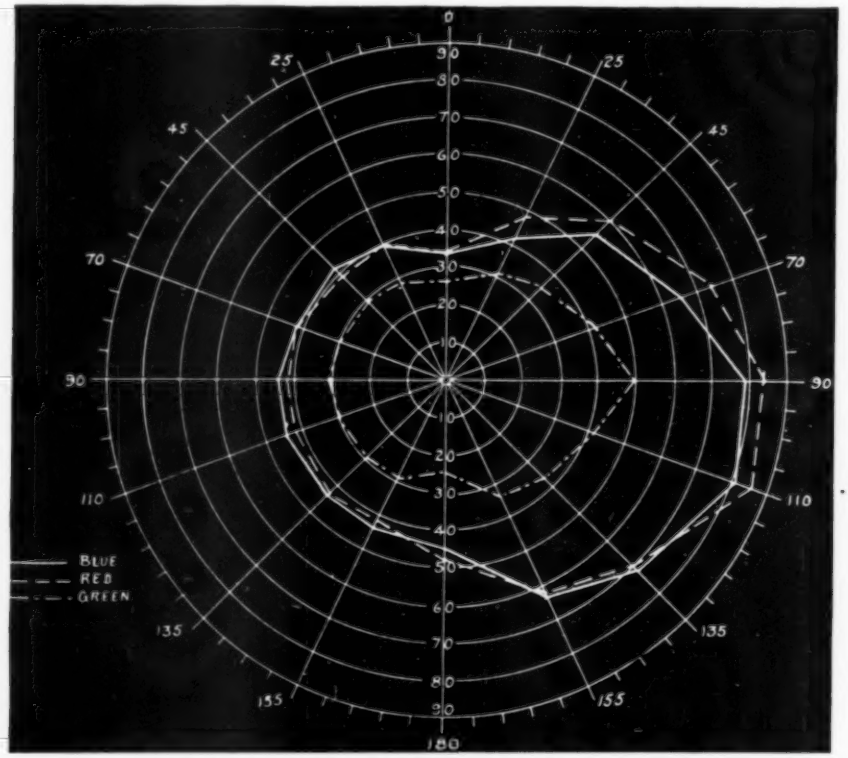

Fig. 13. Fields for red, green and blue for stimuli subtending a visual angle of 2 degrees. Preexposure and surrounding field of grey of brightness of color at limits of sensitivity.

SUMMARY.

The results obtained may be briefly summarized as follows: (1) Size of stimulus is a powerful determinant of the visibility of color in the peripheral field, comparable with intensity in importance.

(2) By increase of size of stimulus the limits of sensitivity to red and blue for stimuli of the intensity employed can be made almost coextensive with the limits of the field of vision. With stimuli subtending a visual angle of 5 deg. illuminated by 7 ft. c. of light, the fields for red were only 6 and for blue only 11 per cent smaller than for a 1 deg. stimulus of white on black. Further increase in size of the colored stimulus for this intensity of illumination did not seem materially to increase the extent of the field. As has been demonstrated in former papers the limits of these colors with higher intensities of stimulation are coextensive with the limits of the field of vision for stimuli much smaller than 5 deg. It was one of the purposes of this paper to see whether this result could be accomplished by increasing the size of stimuli of moderate intensity.

(3) Size of stimulus produced the least effect with a preexposure and surrounding field of the brightness of the color. The effect, as might be expected, was considerably greater for the white and black preexposures and surrounding fields. So far as we have been able to determine, the effect of any factor, nonpathologic or pathologic, is greater in the presence of other factors than when the influence of these factors is eliminated. This fact may contain a suggestion as to methods of increasing diagnostic sensitivity. Any use of a factor for that purpose, however, presupposes the standardization of its influence. Also, to be differential or of value for diagnosis, the effect must be greater on the pathologic than on the nonpathologic eye. This in general seems to be the case.

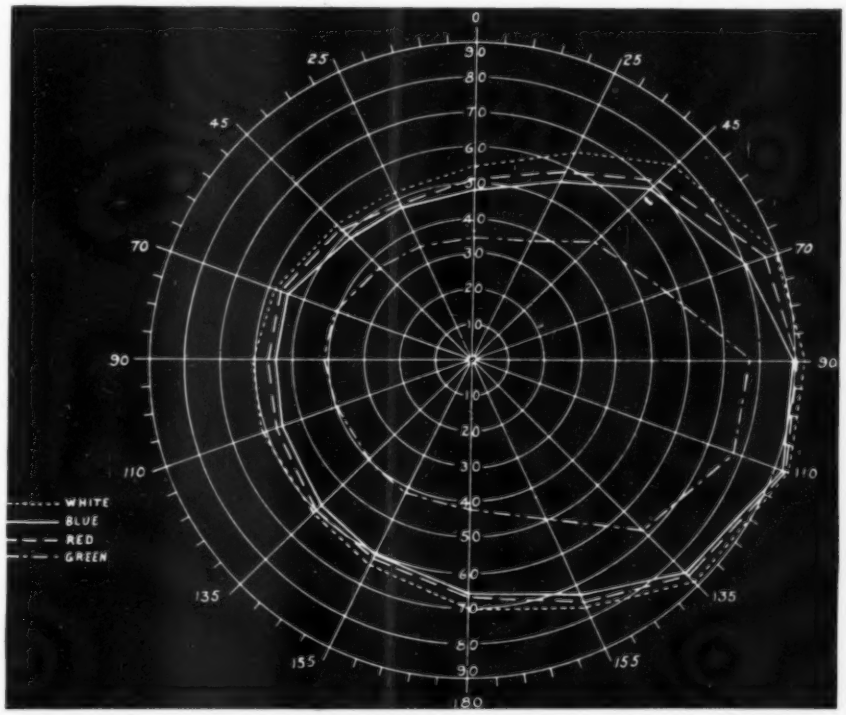

Fig. 14. Fields for red, green and blue for stimuli of optimum size (5 degrees); and for the form field (white stimulus on black, 1 degree). Preexposure and surrounding field of gray of brightness of color at limits of sensitivity.

(4) The effect of size of stimulus in the presence of brightness difference between stimulus and preexposure and surrounding field is shown in Table II to be some unknown relation to the magnitude of that difference. That is, the effect in case of blue and red (the darker colors) was considerably

TABLE I.

Showing the serial numbers and brightnesses in cp. per sq. in.[1] under 7 ft. c. of illumination of the gray pigments (Hering series) which matched the different sizes of stimuli at the limits of eccentricity.

Visual angle (deg.)	Red		Green		Blue	
	Serial number	Cp. per sq. in.	Serial number	Cp. per sq. in.	Serial number	Cp. per sq. in.
5	41	.00127	6	.00651	29	.00214
2	41	.00127	6 3	.00651 .00883	33 31	.00177 .00195
1	33	.00177	7	.00613	33	.00177
0.5	41	.00127	7	.00613	29	.00214
0.17	39	.00161	5	.00682	29	.00214

[1]Values specified in candle power per square inch may be converted into millilamberts by multiplying by 486.8.

greater for the white preexposure and surrounding field and for green (the lightest color) with the black preexposure and surrounding field. A comparison of the coefficients of reflection of the grays which match these colors in brightness with those for the white and black used will show that the brightness difference between green and black and between red and blue and white was greatest.

(5) The decrease in the size of field produced by decreasing the size of the stimulus was, with the exception of blue with the 0.17 deg. stimulus for the white surrounding field and preexposure, greater for red than for blue.

TABLE II.

Showing the effect of size of stimulus on the area in sq. cm. of the color fields for red, green and blue stimuli with preexposures and surrounding fields respectively of black, white and the gray of the brightness of the color at the limits of sensitivity.

Color	Area in sq. cm. of color field for			
	2 deg.	1 deg.	0.5 deg.	0.17 deg.
Gray preexposure and surrounding field				
Red	99.3	56.4	37.4	12.6
Green	36.0	16.8	11.4	6.5
Blue	94.2	54.6	40.25	12.5
White preexposure and surrounding field				
Red	82.5	22.3	9.2	2.0
Green	33.3	13.1	7.5	2.5
Blue	85.6	27.0	17.9	2.5
Black preexposure and surrounding field				
Red	92.5	48.8	30.0	8.2
Green	25.0	8.2	3.2	1.1
Blue	88.1	48.4	34.8	17.8

TABLE III.

Showing in percent the reduction in area of the color field when stimuli of 1 deg., 0.5 deg. and 0.17 deg. respectively are used as compared with the area for a stimulus of 2 deg. Colors: red, green and blue. Preexposures and surrounding fields: black, white and gray of the brightness of the color at the limits of sensitivity.

Color	Percent reduction in area from the field for the 2 deg. stimulus for		
	1 deg. stimulus	0.5 deg. stimulus	0.17 deg. stimulus
Gray preexposure and surrounding field			
Red	43.2	62.3	87.3
Green	53.3	68.3	81.9
Blue	42.0	57.3	86.7
White preexposure and surrounding field			
Red	73.0	88.9	97.6
Green	60.7	77.5	92.5
Blue	68.5	79.1	97.1
Black preexposure and surrounding field			
Red	47.2	67.6	91.1
Green	67.2	87.2	95.6
Blue	45.1	60.5	79.9

TABLE IV.

Showing for comparison the area in sq. cm. of the color fields for the optimum size of stimulus and of the form field (white on black) for a 1 deg. stimulus. Size of colored stimulus, 5 deg.; preexposure and surrounding field, gray of the brightness of the color at the limits of sensitivity.

Stimulus	Size of stimulus	Area of field (sq. cm.)
Red	5 deg.	156.5
Green	5 deg.	77.4
Blue	5 deg.	147.3
White	1 deg.	166.0

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MYIASIS WITH CHRONIC DEGENERATION OF CORNEA.

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In this case eggs of Aphiochaeta Scalaris, deposited in the diseased cornea, were contained in scrapings from the cornea, and in cultures developed into larvae, which were identified by expert entomologists. Reported from the Madras Government Ophthalmic Hospital.

A condition resembling the dystrophia epithelialis corneae of Fuchs is not uncommonly seen in our outpatient department. As it is not clear whether it corresponds with the affection described under this name, we sometimes for convenience speak of it as crusted keratitis, but it is sufficient for the present purpose to regard it as a malady of the cornea of that type. I was engaged in investigating such a case bacteriologically when a somewhat surprising coincidence was met with. This may be described in the words of a letter which I wrote to my former colleague, Major W. S. Patton, I.M.S. (retired), part author of the well known work on medical entomology; there are a few unimportant alterations and omissions.

"After a thoro washing of the cornea for 4 minutes with sterilized normal saline, I took off the crust and crushed it up in a petri dish. I then planted it on some blood smeared agar, serum agar, and glycerine agar (Sabouraud's). I did the same with another type of eye (a bullous keratitis), with similar tubes derived from the same source. Some 24 hours later all the tubes were removed from the incubator and placed on a shelf in the laboratory for inspection. They were all subcultured and the subcultures incubated 24 hours and left at room temperature. It was noticed on examination a week after the first implantation that there were maggots on the blood smeared agar and glycerine agar tubes from the case of crusted keratitis, both in the original tubes and the subculture tubes, about the same size. Nothing in similar tubes from the other cases. I put the maggots into mince meat and earth and hatched out the flies which I send herewith.

My idea is that this fly must have deposited ova in the mass of debris on the cornea (fairly deep to escape the saline irrigation for 4 minutes) and that on crushing up this corneal crust the eggs (or minute larvae) were distributed thruout the mass and planted in the tubes. (Coarse planting was adopted as I was looking for fungi). Some of the subcultures after 48

hours were also coarse and included in the platinum loop some of the original debris and hence larvae. The other tubes of the same culture media, same age, derived from the same source, and subjected to same incubation and explored in the same room acted as controls; so I think it is unlikely that flies gained access accidentally to the tubes in my laboratory. What the fly is I do not know, but I dare say this fly might lay in a cornea covered with a crusty sort of scab. The fly is familiar somehow in its movements. It runs rapidly about and jumps a bit, but rarely flies. Can you spot them for me?"

Major Patton had gone to China, but Mrs. Patton kindly offered to deal with the correspondence and the specimens. Meantime I had sent some of the specimens to Major H. H. King, I.M.S., present director of the King Institute here, who wrote to me that the entomologist on his staff, Mr. Sitarama Iyer, had identified the flies as "Aphiochaeta ferruginea" belonging to the family of Phorinae, a species known to cause myiasis in man. Eventually Major Patton wrote from Shantung. He had not up to the time of writing received the specimens.

"I am, however, pretty sure that the fly is Aphiochaeta scalaris (ferruginea). It belongs to the Phorinae. I gather this from your statement that 'it runs rapidly about and jumps a bit, but rarely flies.' This is absolutely characteristic of the Phorinae. If you will look up the back numbers of the Indian Journal of Medical Research[1] you will see a paper on this fly. I think you will be able to spot it."

Shortly afterward he wrote again. "The fly is what I thought it was. It is a most interesting case and I hope you will record it. This fly often causes myiasis in all sorts of places and I have little doubt that it is commonly missed as its larvae are small."

The man had been in the hospital some time, but the fly must have actually deposited ova on his cornea shortly before the scrapings were made. I have never seen a case of larvae developing in the eye of a patient while in hospital; and altho we watched this man carefully, no maggots appeared. I probably removed all the eggs, or early larvae, at the time of sowing the original tubes. Other similar cases of corneal degeneration were actually under observation at the same time; they showed nothing of this nature. I do not suppose that the fly has any predilection for this particular condition. Most of the cases show an insensitive cornea and hence the fly might deposit ova without being disturbed. But this particular case was not associated with loss of sensation except on the actual patch.

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[1] The Indian Journal of Medical Research, Vol. IX, July 1921 to 1922, p. 683, Notes on Some Indian Aphiochaeta by W. S. Patton, M. B. (Edin.) F. E. S., I. M. S. (Retired), Lecturer on Medical Entomology, Edinburgh University, illustrated by Edith M. Patton.

THE CYSTIC PHASE OF GLIOMA (RETINOBLASTOMA).

C. PASCHEFF, M.D.

SOFIA, BULGARIA.

The complete history of this case made certain a diagnosis that would otherwise have been very obscure.

In the "Contributions to Ophthalmic Science," Dr. H. Gifford speaks of the cystic phase of glioma, considering the cysts as pouches of degenerated retina —an explanation which Elschnig has given for the cystic condition of sarcoma of the retina. Unfortunately he brings us no histologic proof of it and says that he has found no mention of it in the best known textbooks.

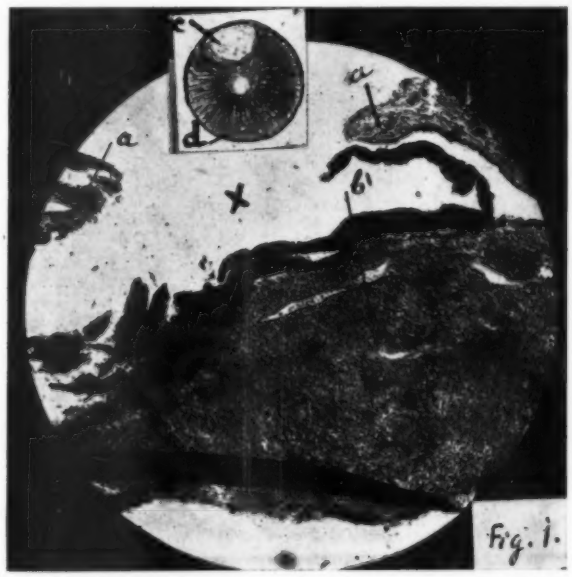

Fig. 1. Cystic intraocular tumor sketch of growth above; section, below. (Pascheff).

In the interest of science I must say that such a gliomatous cyst has been described by me in the Klinische Monatsblätter für Augenheilkunde, 1924, p. 126; and reported also in the German Ophthalmological Congress in the same year.

The cyst was observed in a boy aged 7 years. It had developed in the upper iridocorneal angle (Fig. 1 c) and was hanging in the anterior chamber. It was of a whitish color, having the walls studded with infinitely small white grains. One grain was swimming in the anterior chamber. (Fig. 1 d.) The pupil and the fundus were normal. The vision was also normal.

The cyst was excised with an iridectomy.

The histologic examination of the excised cyst (Fig. 1 x) gave the structure of a glioma (Fig. 1 c) and the cyst was made up of a gliomatous infiltration (Fig. 1 aa) and the pigmented epithelium was very much folded up. As the parent did not agree to enucleation it was not done until a few weeks later. During this time I could observe very interesting phenomena. In the vitreous were seen many white gliomatous masses. In the anterior chamber they formed precipitates on the posterior surface of the cornea and were also deposited as hypopion.

After enucleation the eye was histologically examined. The glioma was seen to begin in the root of the iris and the ciliary processes. The precipitates were formed by the gliomatous substance. The patient died a few months later on account of recurrence. The gliomatous cysts were observed also in the brain. They were caused by the splitting of the tumor itself.

INTRAOCULAR FOREIGN BODY PROBLEMS.

PAUL S. MERTINS, M.D., F.A.C.S.

MONTGOMERY, ALA.

Details of actual cases teach the management of ocular injuries. Four cases are here reported. In one, lack of accurate x-ray examination led to inefficient treatment. A good radiogram made possible extraction of copper, lying on the retina. In case 2, unsuccessful magnet extraction was followed by success, when a cataract knife was used as a magnet extension. In case 3 the patient failed to come for magnet extraction, and later had the eye enucleated. Case 4, multiple shot wounds in both eyes caused loss of vision in one; but allowed useful vision in the other for at least ten years.

Observation of a number of cases of one condition give a different viewpoint from that which one derives from the literature alone. To record some failures, as well as to report some successful cases with the lessons learned, is the object of this paper.

Given a penetrating wound of the eye in which a foreign body may have entered the globe, a methodical routine examination should be employed in every case, if one would avoid error and chagrin. Three points in order should be determined: 1st. Is there a foreign body within the eye? 2nd. Where is it located and what is its nature? 3rd. After considering these points carefully, one can then decide what will be the best procedure to follow in the given case, to repair the damage.

In making a diagnosis a careful history of the accident may determine whether a foreign body is within the globe. History of a wound with knife, scissors, nail or other large object, at once tells us there is probably no foreign body present; while with the history of a wound from a small chip of steel or iron, or a gunshot wound we may feel reasonably certain the foreign body lies within the eye, or else that it has passed entirely thru the eye and lies in the extraocular tissues. If no wound of entrance can be seen, palpation may detect a lowered intraocular tension. If the pupil is dilated, the lens and ocular fluids are clear, the ophthalmoscope and slit lamp may be of great and positive value. In any case of injury about the eye, where there is the least suspicion of foreign body, an x-ray should be made. Radiograms in the case of metallic foreign bodies will determine their presence, even when they are exceedingly small; and if made with the aid of a localizer will determine their position with accuracy. Examination with the ophthalmoscope and x-ray may each lead us astray if taken alone, while if taken together, and their combined values carefully considered we may reduce the chance of error to a minimum.

The following case illustrates a failure from which a lesson may be learned.

Case 1. J. B. aged twelve, was hit in right eye by a small chip of copper from a percussion cap explosion. He was brought in during my absence from the city and was referred to a colleague. His notes state there was a small linear corneal wound, near limbus in lower quadrant. The lens was clear. Vision was hand movements at four feet, there was a hemorrhage in lower anterior part of vitreous. Radiologists report was "foreign body in orbit extraocular." Relying on this report it was decided that the chip of copper had passed thru the eye, and that rest, cold applications and atropin were the only treatment indicated. A second oculist consulted, relying on the same x-ray report, gave a like opinion.

I saw the boy for the first time twelve days after his accident. The eye was still irritated. The intraocular hemorrhage had cleared up, and now a rather brightly reflecting object could be seen in the lower anterior part of the retina. Patient was referred to the radiologist for reexamination, the first report having been made from a general snap x-ray. A more careful examination, with the Sweet localizer, confirmed the ophthalmoscopic exami-

nation and localized the foreign body 10mm. below center of cornea, 12mm. back and 7mm. to temporal side.

The boy's parents were informed of the danger of leaving the copper within the eye, and operation was advised. Under ether anesthesia a conjunctival flap was dissected back, and a right-angled scleral incision, about four mm. on each side, was made. The angle of the scleral flap was elevated with a sharp hook, and lying on one edge of the opening could be seen the piece of copper. This was removed with forceps, and the conjunctival flap sutured. There was uneventful recovery with a resulting 20/70 vision.

In this case the only chance of saving the eye was taken. Thru the accuracy of the x-ray technician, the aid of the ophthalmoscope, and a combination, as my assistant claimed, of good luck, we snatched success from what appeared a hopeless situation.

A general x-ray is of value in determining the presence of a foreign body within the orbit, but is of little value in determining whether it is intraocular. To be accurate a radiogram made with the aid of a localizer is essential. We should learn from this case never to condemn an eye containing a foreign body to enucleation, if by any chance the foreign body may be removed. Enucleation can always be done when other means have failed.

Case 2. Mr. S., machinist, on hitting a bolt with a hammer felt a sharp momentary pain in his left eye. He continued to work during the morning, but by afternoon his vision became blurred, and the eye painful. Examination of the left eye showed ciliary injection and a very small corneal wound near the outer limbus. The pupil had been dilated with atropin. A 2x2 mm. slit, in the outer quadrant of iris was noted, and within it a silvery gray speck. By focal illumination a dark streak could be seen, extending obliquely thru the lens and apparently leading to the slit like opening in iris. Due to slight haziness of lens, details of fundus were blurred. Spicule of iron or steel in lens was the diagnosis. An unsuccessful attempt at magnet extraction was made. The patient was then referred for radiogram and to my surprise two foreign bodies were found; one intraocular 1x2 mm. in region of optic nervehead, the other within the depth of the orbit. Under ether a second effort at magnet extraction by the anterior route was made without success. Attempt at extraction by posterior route was likewise a failure, until the narrow blade of a cataract knife was introduced thru a scleral incision and the magnet tip applied to blade. On withdrawing the knife blade a small spicule of steel was found clinging to it. The cataract rapidly became complete and after several weeks the eye was free of irritation.

In this case I failed to correctly locate the foreign body at first, because I did not use every method of examination at my command. If the x-ray had been taken before the first attempt at magnet extraction it would have properly located the foreign body. When the magnet fails to attract a foreign body, do not introduce the magnet tip into wound. A narrow cataract blade can be used as an extension tip and causes less trauma to the vitreous.

Case 3, was that of a negro, who was hit in the eye by a piece of steel, while hammering on a nail. A small perforation at the lower corneoscleral junction was noted. The tension was normal. Ophthalmoscopic examination showed an intraocular foreign body, in the lower anterior part of retina. The patient was referred to the hospital for magnet extraction, but failed to appear at the appointed time. He returned two years later stating that he had experienced no pain in the eye after leaving my office, and that vision in the injured eye had been fair. For the last ten days, however, the eye had been very painful and vision had failed. The upper lid was swollen, the conjunctiva edematous, the cornea hazy. Tension plus 2 and vision nil. Attempt at magnet extraction failing the eye was enucleated. On section a spicule of steel 2x3 mm. was found embedded in the lower anterior section of the retina.

From this case we learn that tho a

foreign body may remain quiescent in an eye for a long time and useful vision be retained, in the course of time inflammation usually follows. A foreign body should always be removed from the eye when possible, but enucleation should not be performed so long as the eye has useful vision and is free from pain.

Case 4. A five year old boy was shot in the face and eyes by a companion, with a 22 calibre rifle, the small shell being loaded with mustard seed shot. His face was peppered with shot, and in each eye six or seven wounds of entrance were noted. Iced boric compresses and atropin were employed. Vision in the left eye slowly failed, while vision in the right eye after ten years time is still 20/30 with his correction. Several shot, or rather spots of choroid disturbances can be seen in the fundus with an ophthalmoscope. One or more foreign bodies may for years remain in an eye and the eye still retain useful vision.

In any wound of the eye, or about the orbit, an intraocular foreign body should be suspected, and we should not be content until every method has been employed to prove its absence.

Instruction should be given in all industrial plants that no effort at removal of a foreign body shall be made, except under direction of the company oculist, and the following precautions should be taken to avoid infection.

In all shops a package of sterile eye pads and tubes of one to three thousand bichlorid ointment should be kept on hand. In case of accident instruction should be given to squeeze the bichlorid ointment between the lids of the injured eye. An eye pad should then be applied and the case referred to the company oculist for further treatment.

1115 *Bell Bldg.*

A LENS EXPRESSION HOOK.

FREDERICK O. SCHWARTZ, M.D.

ST. LOUIS, MO.

This new instrument specially designed for its purpose will replace the makeshifts that have been used for the expression of cataract. It distributes the necessary pressure as widely as possible but emphasizes it properly at the point opposite the center of incision. Read before the Ophthalmic Section of the St. Louis Medical Society, April 8, 1927.

The ultimate major step in any modern operation for cataract is the removal in one of several ways of the opaque lens. A desire to accomplish this end in the most satisfactory manner caused me to seek for a means, in a mechanical way, whereby this might be done with the least amount of disturbance to tissues.

The use of spoons, spatulas or other instruments in exerting pressure at some point about the lens involves a lot of manipulation, first to remove the nucleus, and then whatever remains of

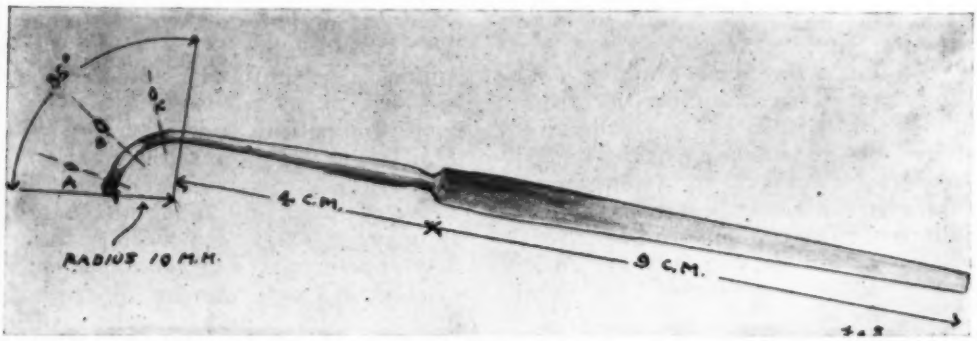

Fig. 1. Lens expression hook with dimensions. Sections A and C are 1x2 mm. Section B is 1.5x2 mm. and represents a plane passed thru the raised or lumped portion.

the cortex in the anterior chamber, when the operation is done extracapsularly.

It has been my experience that a spoon or flat spatula, while removing the nucleus, never carried with it at the first sweep all the soft lens substance, which should have been removed, but which usually is removed by several successive strokes of the instrument over the anterior corneal surface, in an effort to clear the anterior chamber. Some operators prefer to wash the anterior chamber of these lens particles. Either method entails unnecessary handling of tissue, which is to be avoided in ideal surgery. Then again, lens substance caught in the capsule remains means a thick postoperative membrane.

An embodiment of features which would eliminate the faults of usual practices was the basis of the idea upon which a new instrument was conceived. It is nothing more than a piece of rigid metal 2 millimeters wide and 1 millimeter thick, curved on the flat in an arc of 95°, and closely corresponding in curvature to the average corneal circumference. A radius of 10 mm. was found best to construct this curve in the original design.

In the center of the arc, and at its deepest pressure point during use of the instrument, a raised or humped portion is placed on each side, and slopes toward the ends of the arc. This hump is on section 1.5 millimeters in thickness, and by placing such an enlargement on both sides, the instrument may be used in either hand. One end of the arc is fixed onto a shank 4 centimeters long, which in turn is attached to a handle of 9 centimeters.

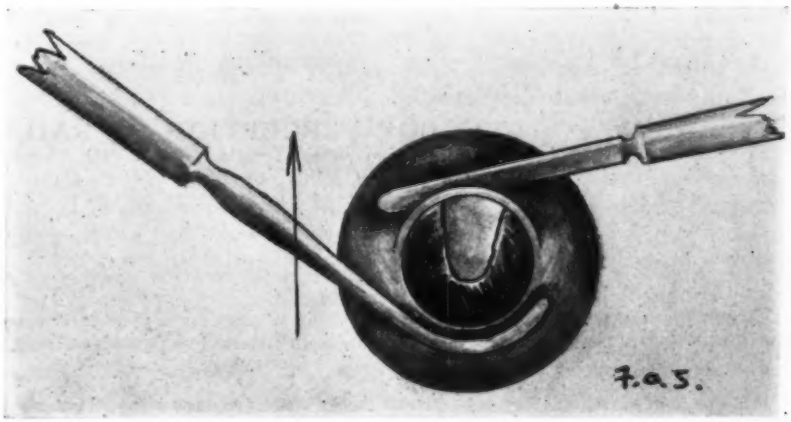

Fig. 2. Showing expression hook in position for use. Arrow indicates direction of traction upward.

It may be called a "Lens Expression Hook," for that is its purpose.

In using it, after the usual corneal section, iridectomy and capsulotomy have been done, the operator stands to the right or left side, or behind the patient's head, holding the hook like a pencil, in either hand. It is placed with its concave edge about 4 millimeters beyond the inferior point of the corneoscleral junction. Gentle pressure is made from that point in a horizontal plane, toward and against the lens border. At this point resistance will be met, but can be overcome by continued pressure and slight oscillation. Slip-

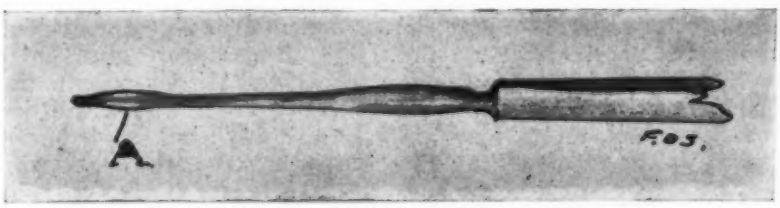

Fig. 3. Showing bulging of hook at A, viewed laterally.

ping over the anterior surface of the cornea must be avoided, and continued pressure toward the incision must be maintained.

At this junction the lens should make its appearance at the wound (I place my incision always just posteriorly to the limbus) and is then expressed in the ordinary manner.

The entire solid contents of the anterior chamber should be removed at one stroke of the instrument, and from this point the operator follows his own choice of technic in completing the operation. The reproduced photographs and drawings show the instrument and its manner of use. It may be obtained from V. Mueller and Co., of Chicago.

NOTE—Since this paper was read I have delivered the cortex, nucleus and posterior capsule intact at one sweep, in spite of the capsulotomy. Intracapsular extraction has also been done by the same technic. A paper on my results with my method for intracapsular extraction will follow shortly.

Metropolitan Building.

VISUAL ACUITY AND COLOR PERCEPTION OF RAILWAY EMPLOYES.

HUGO REIM, M.D.

ST. LOUIS, MO.

The former neglect of visual tests for railway employes and the dangers of such neglect are indicated. A crude apparatus, for testing color perception, proved ineffective. A reexamination, with Ewing optotypes for vision and the Jennings' test for color perception, showed a large proportion who had defective vision, among over five thousand men examined. Read before the St. Louis Ophthalmic Society, January 28, 1927. See p. 440.

The periodic reexamination of employes in the train service does not seem to have been given very serious consideration, by the majority of the railroad companies, altho the chief surgeons of the companies have recommended and suggested it to the management for a number of years. I have not been able to ascertain which was the first railroad to do this, nor how long it has been done, nor how many are now doing it. I am certain that the majority do not, and only one railroad with its general offices in St. Louis is doing it. It is quite obvious that it should be done by every railroad, not only from a standpoint of safety to the traveling public and to the employes themselves, but also from a standpoint of financial economy, i. e. property damage and loss thru wrecks, etc.

We all know that diminution of visual acuity occurs in many individuals, due to injuries, diseases, and errors of refraction, such as progressive myopia. The following is an example of the necessity of periodical examinations. When I came to Kansas City in 1901, to examine the employes of a certain railroad there, I was informed by the master mechanic that he had long suspected that a certain locomotive engineer had quite defective vision. This man did not show up for examination. I learned later, that he went to the company's ophthalmologist in St. Louis for examination, who immediately took him out of service, when he found almost mature cataracts in both eyes. This man was between 65 and 70 years old, owned a very nice home and had an income of about $1,000 a year, besides being eligible to retirement and a pension from the company of about $70.00 a month. He had no one but himself and his wife to support, so there was no reason why he should not have retired voluntarily. He was engineer on the very fastest passenger train between Kansas City and Florida; and the only reason he did not kill himself and a good many passengers was that he always had a fireman with good vision.

Here is another. I was told, by an engineer, of a man who fired for him six or eight years; and tho totally color blind it was not discovered, even by the engineer, until the man was forced to take an examination for promotion. He got by with it in this way: In the day time a locomotive carries either a green, or red, or white flag, on each side in front. When it gets dark it is the fireman's duty to replace these

flags by lanterns of the same color. This fireman would jump down off the engine and call up to the engineer, "All right Jim hand me the lamps." Of course, he always got the right ones.

Sometime in 1920, the Superintendent of Motive Power of a railroad was killed while asleep in his private car, which was parked on a side track. Some one had carelessly left the switch open, and, while it showed a red light, the engineer of a freight train coming along the main line could not, or did not see it, and crashed into the private car killing the superintendent and himself. The company then decided that it was about time they were having their employes reexamined as to vision and color. I was requested by the Chief Surgeon to conduct this reexamination and in January, 1921, we began; but on such sort notice that we did not have much time to think out the details. We used an ordinary large Snellen test card and this was not at all satisfactory, as it was too easy to memorize. Our method of color testing was also very crude and unsatisfactory. We rigged up a disc into which four round holes were cut, and into these holes we fastened the regular lenses that are used in switches and semaphores, i. e. red, green, yellow and white. This was mounted on an axle with an electric light behind. By turning the disc on its axle the different lenses could be brought before the light.

The first thing I discovered was that the green lens was decidedly blue. We tried to get a green lens and found that they were all blue. There is a very good reason for this, as all the railroads use oil lamps behind the lenses and as the lamps give out a yellow light the combination makes a very beautiful green. I overcame this difficulty, however, by pasting a piece of yellow tissue paper on the back of the lens. Ordinarily this would seem to be a very satisfactory way to test the color sense of railroad employes, but it is not at all. We all know that color blind people, and especially railroad men, can tell the difference between colors by the difference in the intensity of light, especially when only the 3 colors are used. As the word went down the line that we were using only the 4 regulation lenses, it was not very hard for them to guess right each time a lens was brought before the light. I was not prepared to make records of the examinations for myself, but I remember that we found only three color blind men. I was sure there were more, but I couldn't prove it.

In January, 1924, or 3 years later, I was requested to reexamine the same men. This time we went about it differently. We procured a superintendent's private car, which could hardly have been built better for our purpose, as you can see by the sketch. In fact private cars are all built pretty much on the same lines. We used the Ewing Optotypes and found them quite satisfactory, as they could be easily and quickly changed. I think a still more satisfactory way would be to use one of the cabinets, in which one line at a time can be illuminated.

For color testing we used the Jennings' modification of the Holmgren test. You are all undoubtedly familiar with this test. In my opinion this is the best method of examining the color sense of railroad men for the following reasons:

1. The man himself makes a permanent record of his color sense.
2. It is quick and accurate.
3. The worsteds are not soiled by handling. Only one skein became soiled in the examination of over 2,000 men, and it was a very delicate pink.
4. The examiner himself cannot make a mistake, even if he is color blind.

Ophthalmoscopic examinations were only made when a man had much disturbance of visual acuity, and then only when we had time. In each instance it was done very hurriedly and in many cases it was not possible to make a diagnosis. For this reason I prefer to call it a survey, and not, as the railroads call it, a reexamination. Reexamination can, however, be done thoroly, even refraction and fitting of glasses in a car of the type I showed you. But it would take a full time man, as it would take at least a year to go over a railroad of any consequence.

Of 5,002 men examined less than half, or 2,438 had a vision of 20/20 or better in each eye. The remaining 2,564 had the following visual accuity: 1,004 had 20/20 in the better eye, and in the poorer eye 658 had 20/30, 213 had 20/40, 63 had 20/50, 21 had 20/75, 6 had 20/100, 11 had 20/120, 3 had 20/150, 2 had 20/200, 3 had 20/250, 4 had 10/250, 2 had 5/250, 1 had fingers at 1 ft., and 1 had light perception.

275 had 20/25 in each eye. But with 20/25 in the better eye the poorer eye in 219 had 20/30, 85 had 20/40, 16 had 20/50, 17 had 20/60, 17 had 20/75, 3 had 20/100, 3 had 20/150, 2 had 20/250, 1 had 5/250, 1 counted fingers at 1 ft., and 2 had only light perception.

842 had 20/30 in each eye. With 20/30 in the better eye, 86 had only 20/40 in the worst eye, 22 had 20/50, 16 had 20/60, 10 had 20/75, 5 had 20/120, and 1 had 0.

55 had 20/40 in each eye. Of others who had 20/40 in the better eye, 30 had only 20/50 in the other, 44 had 20/60, 20 had 20/75, 2 had 20/100, 5 had 20/120, 1 had 20/150, 1 had 20/250, 1 had 10/250, and 3 had light perception in the other.

21 had 20/50 in each eye; but with this in the better eye, 26 had only 20/60 in the other, 7 had 20/75, 3 had 20/100, 4 had 20/120, 2 had 20/150, and 2 had 20/200.

48 had 20/20 in each eye. Others who saw this well with the better eye 40 had 20/75 in the other, 5 had 20/100, 10 had 20/120, 3 had 20/150, and 1 only fingers at 1 ft.

34 had 20/75 in each eye. Of others who had 20/75 in the better eye 13 had 20/100 in the other, 27 had 20/120, 3 had 20/150, 1 had 20/200 and 1 only 20/250.

9 had 20/100 in each eye. Of others having 20/100 in one eye 11 had 20/120 in the other, 1 had 20/150, and 1 20/200 in the worse eye.

36 had 20/120 in each eye. Of others having 20/120 in one eye 9 had 20/150 in the other, 3 had 20/200, and 5 only 20/250 in the worse eye.

5 had 20/150 in each eye. Of 2 seeing this well in the better eye 1 had 20/250 in the other, and 1 could only count fingers at 5 ft.

5 had 20/200 in each eye and 3 had 20/200 in one eye and 20/250 in the other. 4 had 20/250 in each eye; 2 had 10/250 in each eye, but one was corrected to 20/20 and 20/25, and the other to 20/40 and 20/30.

The others who had a large amount of visual disturbance, except those who had corneal scars, all wore some sort of correction. One man apparently had premature presbyopia. He was 30 years old and wore about plus 2.00 D., added to his distance correction. Whether he was really presbyopic, or whether the addition was just taking care of his latent hyperopia, I cannot say. He was fitted by an optician. His distant vision was 20/30 each without glasses and 20/25 each with glasses. 38 were color blind. One conductor was red blind, one green blind and 2 were red and green blind; 3 brakemen were red blind, one was green blind, and 8 were red and green blind. One engineer was red blind, and 6 were red and green blind; 2 firemen were green blind and 2 were red and green blind. One switchman was red blind, 2 green blind and 8 red and green blind.

Of these one had vision 20/10 in each eye. 1 had 20/12 in each, 5 had 20/15 in each, 9 had 20/20 in each, 3 had 20/25 in each, 2 had 20/30 in each. In one of these the discs were very red and swollen. One had 20/50, corrected to 20/20 in each. 1 had 20/60, corrected to 20/25 in each. 1 had 20/100, corrected to 20/40 in each. I had 20/120 corrected to 20/40 and 20/30. 7 had 20/20 and 20/25. 1 had 20/120 and 20/150, corrected to 20/20 and 20/25, 1 had 20/12 and 20/120, and 1 had 20/60 and 20/75 corrected to 20/75 each.

One, an engineer, had 20/50 and fingers at 2 ft., traumatic cataracts and had no correcting lenses. Another engineer had 20/20 and fingers at 1 foot, internal strabismus.

The question naturally arises: how is it possible that so many men in the transportation service of the railroads have defective vision and color perception. Defective vision can be accounted for in many ways: injuries,

diseases, etc., after entering the service. High errors of refraction and defective color sense are not so easy to account for, tho one of the color blind men very probably had optic neuritis.

The only way I can account for these men who apparently did not have disturbance of vision or color perception on entering the service is: that either some one substituted for them in the examination, or that the examiner was himself color blind, or was dishonest. Substitution of one man for another can easily be prevented, and with the Jennings' test it does not make any difference if the examiner is color blind. Dishonest doctors are very scarce so that this factor is practically negligible.

Metropolitan Bldg.

OPHTHALMOLOGIC INTERNAL MEDICINE.

J. Heyward Gibbes, M.D.

COLUMBIA, S. C.

To the internist the eye appeals as an organ indicating disorders in other parts. To get the benefit of what it shows, he must make critical inspection, test the action of the different muscles, consider the significance of changes apparent in the pupil, or varieties of ocular hyperemia. He should also make an intelligent ophthalmoscopic examination, and hold in mind the evidence, that may be found in the eye, of general or focal infections. Read before the South Carolina Society of Ophthalmology and Oto-Laryngology, November, 1926.

No terse definition of internal medicine has ever been given, and it is probable that none can be had. Dr. Osler spoke of it as follows: "Not itself a specialty (tho it embraces at least half a dozen), its cultivators can not be called specialists, but bear without reproach the good old name physician, in contradistinction to general practitioners, surgeons, obstetricians, and gynecologists." This attempt at a negative delimitation of the field that properly belongs to internal medicine would have to be immensely enlarged in order to serve a useful purpose, for example, neurology, ophthalmology, otolaryngology, urology, dermatology, and all of the other narrower fields of professional endeavor would have to be enumerated among those that internal medicine is not, and then we should have to reverse our formula and say that it has something of all of them in it, for its concern is with the human mind and body as a whole, its actions and reactions and its interrelations, and no detail of its structure and function, in health or in disease, can be lost sight of in the estimates which are required from this broadest of all specialties. It is pleasing to realize that this wide and intimate contact between medicine and its narrower offshoots, for such, in fact, they are, is not only recognized and tolerated by the latter, but generally welcomed by them. The relatively circumscribed points of view that go with the detailed efficiency of specialization frequently need the correlating function of general medicine, and this service internal medicine must stand ready to supply.

This wide and diverse contact of internal medicine carries imposing obligations to its votaries, the need for study in many fields, a clear understanding of fundamental principles in almost every phase of medicine, and a discriminating judgment in the face of formidable details. With this obligation goes the rewarding privilege of a broad point of view and a congenial relation with those whose primary interest is in a smaller sphere, and whose wealth of detailed knowledge and skillful technic makes such contact profitable. As a prominent surgeon has said, "It may not be necessary for the internist to prepare himself to act surgically, but it is necessary that he be prepared to think surgically."

In the relation of internal medicine to ophthalmology, we may accept this dictum. It is seldom necessary for the internist to act in eye diseases, i. e., to undertake the management of such disorders, but it is everlastingly necessary that he be able to think intelligently about them. In fact, in his capacity of diagnostician, the internist must find a thoro knowledge of the

anatomy, function, and disorders of the visual apparatus indispensable. So true is this that I feel no hesitancy in speaking of ophthalmologic internal medicine.

As far back as written record carries us we find a fixed belief in the mind of man that the eye offers an index to character, betrays intentions, portrays emotions, gives earnest of sincerity, and warning of evil, and truly reflects strength or weakness in the body or its parts. The evil eye of folk lore is familiar to all. So tangible a possession was this that no scruple was felt for burning as witches those in whom it was observed. And today we find remnants of such superstitions. I have known a man to walk entirely around a city block in order to avoid meeting a person whose eyes were crossed because of the belief that such contact carried evil with it. Shakespeare exclaims, "By Heaven, the wonder in a mortal eye!" and his references to the eye, in keeping with popular thought, show that he did, in truth, consider it wonderful and versatile as well.

While as scientists we are no longer privileged to find ocular evidences of witchcraft, to see sparks of anger or too much virtue "launched in the eye," we have traded these alluring but indefinite conceptions for the more tangible exophthalmos of Graves' disease, the sunken eye of wasting strength, and the fire of inflammation. The small eye of hyperopia, the relatively larger myopic bulb, the watery eye of advanced renal insufficiency, the restless eyes of myopia and multiple sclerosis, and the divergent eyes of ocular palsies are among the cold, hard concepts that we have placed above those that were formed in superstition, song and story.

To the internist the eye seldom appeals as an end in itself. He looks upon it as a part of a composite whole, the body in general, and reflecting or directly indicating disorders in function or structure in remote or contiguous parts. In order to read these signs aright, he must know the art of observation, he must possess the information that is to make his judgment sound, and he must be equipped for the necessary technical study. He must keep ever in mind the following: local conditions devoid of general significance, local conditions that signify constitutional disturbances, and local conditions that point to focal disorders. By focal disorders I have special reference to the interesting lesions of the brain, such as tumors, abscesses, and hemorrhages, the location of which so often depend upon an intelligent observation of the associated ocular manifestations.

The necessary technical equipment of the internist for these observations is simple in the extreme. He must have an ophthalmoscope, and he should be in possession of a simple perimeter, a small, hand instrument serving well enough. Oppenheim has said that a neurologist without an ophthalmoscope is no neurologist, and this statement applies with equal force to the internist. An intelligent use of this instrument should be as much of a routine as is the use of the stethoscope. The ophthalmologist has no more interest in the fundus than has the internist, for the neural and vascular structures are peculiarly his, and here he has his one chance of directly viewing them while they are viable. The perimeter is not so indispensable, but it is highly desirable in that it affords him an easy means of independently determining the explanation of defects in the visual fields.

In order to guard against omissions, a routine method of observation must be adopted, a type of routine which serves the observer, and not one to which he becomes a slave. The routine to which I refer must be of the kind that carries thinking with it; not the kind that becomes automatic, and tends to subdue thought. It has been said that more mistakes occur from not looking than from not knowing, and we must insure this looking by a systematic approach.

In the first place, a general observation of the eye and its appendages. The condition of the lids, the width of their apertures, undue prominence of one eye or both, the size and tension of the eyeballs, and the function of the muscles that control the eyelids and the superciliary ridges offer important

data that may guide the course of subsequent study.

In the course of the general observation our attention is almost immediately attracted by any gross abnormality in the function of the extrinsic eye muscles, and it is probably on this account that the internist usually proceeds to a study of them before inspecting the coverings of the eyeball. Here we have the four recti muscles, the superior and inferior obliques, and the bundles of smooth muscle fibers that go by the names of Lanström and Mueller and which are concerned respectively with the degree of prominence of the eyeball and retraction of the upper lid. In this one field we get leads to disorders in the function of the 3rd, 4th, and 6th cranial nerves, and have the means of testing the integrity of the cervical sympathetic. Abnormalities here must be traced out to their neurologic associations in the skull, to disseminated lesions in the central nervous system as a whole, and to their relation to pathologic conditions in the neck or mediastinum.

The fascinating subject of the pupil next engages our attention. We must observe the size, shape, and response of the pupils to light and to accommodation, and make comparisons of the two pupils in each of these respects. We must keep in mind that deformities may have resulted from trauma, or that they might be due to inflammatory disease with the formation of posterior synechiae; that errors in refraction, glaucoma, disease of the optic nerve or its end organs, and irritative or paralyzing lesions of the 3rd nerve, or of the cervical sympathetic, may result in unilateral or bilateral deviation from the normal in respect to the size of the pupils; and that the motor mechanism of the pupil may be interferred with, directly or reflexly, so as to produce absolute, reflex or amaurotic rigidity; and we must be able to apply the simple tests which will enable us to differentiate these conditions. Unilateral amaurotic rigidity is easily determined upon finding that the apparently rigid pupil responds when light is thrown into the other eye. Absolute rigidity of the pupil signifies a lesion of the 3rd nerve, either in the nucleus, in the course of the nerve, or in the terminal branches which supply the sphincter muscle of the iris. Such lesions are most often due to syphilis, but they are said to occur in cerebral hemorrhage, brain tumor, multiple sclerosis and alcoholism.

Reflex rigidity, the socalled Argyll Robertson pupil, a failure of the pupil to contract when the eyes are illuminated and the functions of the optic and oculomotor nerves are otherwise preserved, may be either unilateral or bilateral, tho the former is a relatively rare phenomenon. This condition represents a highly selective lesion in the substance of the brain, the interference being with the nerve fibers which pass from the external geniculate bodies to the nuclei of the 3rd nerves. It is strange that such pathologic changes have not been demonstrated in locomotor ataxia and general paresis, tho these are the conditions in which the physiologic defect is most frequently observed; but such changes have been found at autopsy in explanation of an Argyll Robertson pupil observed during the course of multiple sclerosis.

The internist should be acutely aware of the importance of differentiating between conjunctivitis and iritis, on the one hand, and between iritis and glaucoma on the other. He should have no difficulty in making such differentiations on objective signs alone. Circumcorneal injection, which is seen in inflammation of the iris, need not be confused with the redness resulting from conjunctival inflammation, and which has its greatest intensity away from the cornea; tho at times the injection may be so wide spread and intense as to be confusing. In glaucoma the wide pupil, the smoky cornea, the palpable increase in intraocular tension, and the cupping of the optic nervehead should serve to lead him to a proper interpretation. An appreciation of these differences is necessary, in order to avoid diagnostic errors of omission and commission.

Changes in the media are usually discovered by the internist upon his attempt at ophthalmoscopic examination. On this account I mention cor-

neal opacities among them. They are readily recognized, and their significance is usually clear on the basis of the patient's history. It is seldom that we find abnormalities in the aqueous humour. But clouding of the lens is a frequent finding. It is most often seen as a senile change, and in such instances does not materially interfere with our gaining access to the fundic structures. The presence of a frank cataract is readily determined, and offers important suggestions for further investigation. Opacities in the vitreous are usually seen as a diffuse cloud, or as movable bodies of variable size. They are indicative of inflammatory disease in the uveal tract or retina, and lead us to search for the common etiologic explanations of such diseases.

In the fundus the internist finds a wealth of direct evidence, or of material suggestive of disease in other parts of the body. He must study the optic nerveheads, the arteries and veins, the retina and the choroid. Needless to say, he must know the normal and variations within the normal, such as the darker retinal reflex of brunettes and the changed appearances of the optic nerve that occur in errors of refraction. In the optic nerve he may find the lack of definition of marginal edges and the grayish appearance that goes with true inflammation of the papilla, he may see a swelling of the disc with an obliteration of the physiologic cup, that points to increased pressure within the skull, he may observe the lack-lustre grayness of secondary atrophy, or the pearly whiteness and sharp outlines of a primary atrophy, or he may encounter the deepened cup of glaucoma.

The veins will be smaller than normal if their supply of blood is diminished, or shut off thru partial or complete obstruction to the retinal artery; they will be larger than normal if the return flow of blood is interfered with by pressure on the retinal veins or by obstruction to the cavernous sinuses. The normal pulsation of the retinal veins, as they enter the optic nervehead, may disappear as the result of increased intraorbital or intracranial pressure, or as a consequence of the circulatory disorders already mentioned. Pulsation in the retinal arteries is classically seen in the collapsing pulse of aortic insufficiency. But it is important to remember that this pulsation may be seen in the increased intraocular tension of glaucoma, or that it may be produced artificially by direct pressure on the eyeball. The various forms of retinitis, choroiditis, optic neuritis, and combinations of these affections should be readily recognized by the internist, and he should have no difficulty in determining detachment of the retina, the peculiar picture of retinitis pigmentosa, and the characteristic changes in the macula region that are associated with amaurotic family idiocy. More detailed studies are out of his sphere, but he should recognize the deviations from the normal and know the need for seeking further information from his ophthalmologic confreres.

Errors in visual function are of intimate significance to the internist from the standpoint of faulty refraction, disease of the optic nerves, from their retinal end organs thruout their cerebral ramification to the occipital cortex, and disorders in the extrinsic eye muscles, which prevent single vision with two eyes. Pronounced errors of refraction in the patient's eye will demand a plus or minus lens in the ophthalmoscope, which is different from that generally used by the examiner to properly define the retinal structures; while minor errors may be suspected because of the symptoms of headache, dizziness, and socalled eye fatigue.

Disease of the retina, of the optic nerveheads, of the optic nerves proper, of the optic tracts, of the primary optic neuclei, of the optic radiations, or of the visual areas in the occipital cortex may result in dimness of vision, total loss of vision, or in interesting defects in the fields of vision. Ophthalmoscopic study and careful charting of the visual fields offer the means of explaining such disturbances, and will most often permit us to fix the exact site of the lesion. There is nothing more interesting than the physiologic explanation of the hemi-

anopsias and the differentiation of these from the scotomata of varying degree and location.

In this particular, the eye may be said to belong peculiarly to the internist and the neurologist. Weakness in one or more of the extrinsic eye muscles is productive of strabismus as an objective sign and of diplopia as a symptom. We must be prepared to test the function of the six muscles, to know the deviation of the bulb that is to be expected in weakness of them respectively, and to understand the principles governing the projection of the false images in diplopia. The fact that the false image is projected in a direction opposite to that in which the affected eye is deviated or in the direction toward which the weakened muscle normally draws the eyeball is usually sufficient for determining the muscles and nerves that are responsible for a given type of diplopia. Monocular diplopia may be encountered in dislocation of the lens, or more often in hysteria and malingering.

In exophthalmic goitre protrusion of the eyeball is one of the four cardinal signs of the disease, and in the eye we find other signs of a more detailed nature, that indicate disturbance in function in the sympathetic or autonomic nervous systems, and which aid immensely in arriving at a proper diagnosis. Dissociation between the movement of the upper lid and the eyeball, retraction of the upper lids on fixing the gaze, tremor of the upper lids, infrequent winking, increased pigmentation at the angles of the lids, and faulty convergence of the eyeballs are among the signs of this disorder for which we look as a matter of routine.

There is scarcely an acute infectious disease which does not at times have its ocular manifestations, but no useful purpose would be served by my undertaking to detail them. The same may be said of the more chronic types of infectious diseases, diseases of the central nervous system and disorders of metabolism. I shall mention only a few of these conditions.

Syphilis may show itself in the eye, from the primary stage in the form of a chancre of the lids, thru all of the other stages including the quarternary. Iritis is the most frequent secondary lesion, while inflammations of the choroid and retina and optic neuritis show themselves most often in the long, indefinite, latent period of syphilis. During this period ocular palsies may appear. In the tertiary stage gummata may show themselves in the iris, or the ciliary body. In association with general paresis and tabes dorsalis the characteristic pupillary changes are found, and primary atrophy of the optic nerve is not uncommon.

In my own experience, tuberculosis has not been prone to affect the eye. Tuberculous meningitis gives ocular signs of moderately increased intracranial pressure, and tubercles are to be seen in the retinal structures in association with miliary tuberculosis. It has seemed to me that most of the other occular changes, which are spoken of at times as more or less specific of tuberculosis, might better be explained as incidental to a general toxemia, or an associated pyogenic infection.

The same may be said in a general way of the eye diseases that are found in connection with infectious arthritis. I know that it is conventional to speak of rheumatic iritis and rheumatic choroiditis, but it has seemed to me that there is nothing specific in such infections.

Diabetes is supposed to produce a characteristic form of retinitis, but I have failed to find an instance of this in ophthalmoscopic examinations of more than two hundred diabetics. Cataract occurs more frequently in association with this disease, and optic neuritis is relatively common.

Albuminuric retinitis presents an unmistakable picture. It is not often that this finding leads us to a diagnosis, for the other signs and symptoms of chronic nephritis usually antedate the retinal changes. However, the prognostic significance of this retinal pathology is grave in the extreme. The degree of papillary swelling in advanced renal disease may be so marked as to resemble the choked disc of pressure, and it is necessary to be

constantly on guard in order to avoid such confusion.

Disseminated sclerosis and epidemic encephalitis are among the central nervous system diseases which produce their characteristic eye changes. In multiple sclerosis nystagmus and optic atrophy are of equal rank with scanning speech and intention tremor in leading to a correct diagnosis. The initial symptom of epidemic encephalitis is frequently diplopia, so much so that any complaint of double vision should immediately arouse the suspicion of this disease.

Leaving syphilis out of consideration, it has been my experience that iritis, choroiditis, and neuroretinitis have been found most frequently in connection with definite focal infections in the teeth, tonsils, and paranasal sinuses. The specific relationship of cause and effect has seemed to be clearly demonstrated in repeated instances, by the rapid subsidence of the ocular inflammations after the removal or drainage of the focal infections.

Instructions for first aid, that are put into the hands of lay people, give directions for emergency measures, and then emphasize the propriety of calling a doctor. The relation of the internist to the ophthalmologist might be expressed in somewhat the same terms. After he has equipped himself to do all that I have intimated that he must, he should be anxious to submit his findings and seek more detailed information and guidance from those who are doing special work on the eye.

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THE EYES IN BRAIN LOCALIZATION.

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The ophthalmologist helps to determine the position of brain lesions, by studies of the field of vision revealing scotomas, hemianopsias, and sector defects. The ophthalmoscope shows papilledema and optic atrophy. Unilateral blindness and abnormalities of the pupil, associated with other symptoms, give important information. Read before a joint meeting of the Chicago Medical and Chicago Ophthalmological Societies, February, 1927. See p. 447.

Of perhaps greatest importance are visual fields and these should be studied in every instance when in our office routine we encounter lowered vision for which we are unable to account. The presence of severe headaches, projectile vomiting, vertigo, uncertain gait, mind blindness, inability to see well to right or left, all indicate the need for careful field studies. Scotomata, relative or absolute, hemianopsia, homonymous, heteronymous or altitudinal quadrant or sector defects and blind spot anomalies are the important findings.

In the relative scotoma the colors employed are correctly recognized but are dull or altered. If the scotoma is absolute the colors are not recognized. Lesions in the optic nerve, chiasm, optic tracts and calcarine fissure area affect green first and only later are red and blue affected. The scotoma usually found in pituitary disease begins as an upper temporal defect reaching toward and finally including the blind spot. Ring scotoma is occasionally found in multiple sclerosis, lowgrade syphilis and encephalitis lethargica but retinitis pigmentosa in which it is most frequently found must be excluded.

Optic nerve atrophy is found in two types, one with the typical disc pallor accompanied by very much narrowed vessels and contracted fields and the other with good fields and normal vessels but very low central vision.

Pituitary disease produces the primary type of optic atrophy. Suppression of the sex function, acromegaly, headache and difficulty in reading and walking suggest pituitary involvement.

The fields may show, according to Cushing and Walker, bitemporal hemianopsia 25 per cent; one blind eye and heminaopsia in the other in 43 per cent; homonymous hemianopsia in 12 per cent and in 19 per cent no changes in the fields. While in pituitary disease bitemporal hemianopsia has been

considered the classic visual field picture, evidence is accumulating which tends to show that homonymous hemianopsias are more frequent than has been supposed. Cushing states that homonymous defects occur half as frequently as the bitemporal type.

De Schweinitz found homonymous defects in six per cent of his material. Lillie reports his studies in fifty cases of acromegaly. 26 per cent had normal sellae turcicae and chiasmal findings. 42 per cent showed enlargement of the sella, with erosion of the posterior clinoids in the x-ray studies, but with no chiasmal or optic nerve involvement. Only 38 per cent of his patients had definite ocular changes characteristic of chiasmal involvement, associated with enlargement of the sella and erosion of the posterior clinoids.

The classic picture of a tabetic atrophy is a slowly contracting field in which the color fields are the first to be affected. Exceptionally, sector defects occur due to vascular disease. The picture of tabetic disease would not be complete without reference to the vestibular reactions found in this class of cases. Known cases of tabes were studied by John Richards and the author as a research problem, while on duty at the Medical Research Laboratory of the Air Service. The outstanding result in all cases studied by complete vestibular tests was, that tabes produces irritative effects upon the brain stem as shown by markedly increased duration and violence of the nystagmus, as well as the other vestibular reactions induced by the turning and douching tests.

Syphilis usually produces a retrobulbar neuritis with good fields and a central scotoma with low central vision. If, however, it involves the chiasm or optic tracts the typical anopsias will result depending on the location of the lesion. Multiple sclerosis is seen usually as atrophy of the temporal half of the discs accompanied by nystagmus on extreme outward rotation of the eyes. With these signs transient ocular muscle paralyses are occasionally seen, tho without involvement of the pupil.

The visual fields in multiple sclerosis show marked contraction for white and colors and a central scotoma. Sudden blindness in one eye, accompanied by such a visual field picture in the other, suggests a multiple sclerosis.

Areas of sclerosis in the brain stem involve different levels of the posterior longitudinal bundles composed of the nerve fibers supplying the ocular muscles. These lesions may be located by vestibular tests which show absence, perversion or reversal of the normal nystagmus.

The mechanism of choked disc and its exact significance is still a subject for discussion. Generally speaking the neurologists seem committed to the explanation, that the fluid in the vaginal sheath of the optic nerve is cerebrospinal fluid forced there by increasing intracranial pressure. Many ophthalmologists on the other hand believe that the papilledema is caused by pressure downward from the dilated third ventricle upon the chiasm, interfering with the return venous and lymphatic circulation. Where the pressure is sufficient, retinal edema with exudates results, a picture indistinguishable from an inflammatory process. It seems probable that either of these hypotheses may be correct in certain cases.

The stage of progress of brain tumor at which papilledema appears depends upon the location of the lesion. The early cases of choked disc result from tumors of the pons and anterior portions of the cerebellum, lying close to the third ventricle, while in the cases where the papilledema appears late, the lesion is more centrally located. Sharp's production of artificial papilledema in young puppies, perhaps favors the theory that the papilledema is caused by the forcing of cerebrospinal fluid into the optic nerve sheath. He inserted a gelatin capsule filled with cotton into the aqueduct of Silvius. Disc changes occurred in six hours and definite elevation in from 12 to 24 hours. Decompression then relieved the pressure and the discs returned to normal.

Reports from various observers who had opportunity to study head injuries

during the late war indicate the value of papilledema as a diagnostic sign. These findings have been analyzed and the following summary arranged by James Patton.

I. The presence of papilledema especially when associated with recent intracranial injuries is positive evidence of intracranial injury.

II. In cases where an extensive traumatic decompression is present, should the disc become progressively blurred, further relief of pressure should be secured.

III. In milder cases the symptoms above referred to may be relieved by spinal puncture.

IV. Even tho there may be an extensive fracture, providing there is no great destruction of brain tissue, the absence of papilledema is of very favorable prognostic significance.

A somewhat rare symptom complex is the association of complete unilateral blindness with hemiplegia of the opposite side of the body. The blindness is sudden and occurs simultaneously with the hemiplegia and loss of consciousness. The condition is associated with thrombosis or embolism of the central retinal artery and the middle cerebral artery. This picture occurs in individuals with evident cardiovascular disease and has been confirmed by autopsy. Tumors of the temporal lobe, due to the latency of this region, are difficult to recognize. Eye findings are frequently useful in the diagnosis of such lesions. Apparitions of odd people often in unusual dress may appear. Hemianopsia of the opposite eye is usually present. Fixed pupils have been noted, in cases where the growth involves the corpora quadrigemina.

Transient processes of the ocular muscles, and even a transient Argyll Robertson pupil, have been found in cases where great pressure occurred. Tumors of the corpora quadrigemina occur early in life and are secondary to tumors of the pineal gland. There is usually great pressure on the third ventricle with resultant choked disc of high degree. Sudden blindness from pressure on the optic tract is frequently found, early in the case.

In an outline such as this, mention should be made of that other "window of the brain," the vestibular apparatus. This is especially appropriate, as the ocular apparatus plays such an important role in the vestibular studies. After the stimuli produced by the turning and douching tests, nystagmus is produced, which indicates the integrity, or otherwise, of the Deiter's nucleus and the longitudinal fasciculus in the brain stem. Stimulation of the horizontal semicircular canal produces horizontal nystagmus, with the quick component toward the ear opposite that stimulated. This is a normal response while its absence proves that there is a block in the medulla. Stimulation of the vertical canals produces a rotary nystagmus, away from the ear being tested. The presence of this type of nystagmus shows a normal pons, in the region of the longitudinal bundle, and its absence a block at this point.

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HEREDITARY OPTIC ATROPHY.

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These cases occurring in a mother and two daughters presented great reduction of central vision and limitation of fields for color, altho the periphery of the fields for form were little, or not at all, diminished. The optic discs were pale, and in the mother the retinal vessels contracted. Read before the Sioux Valley Eye and Ear Academy, January 18, 1927.

No attempt will be made to describe this disease as I know you are familiar with the condition which has been so classically described by Leber as to frequently be called, or alluded to as Leber's disease, and has also been well described clinically by such men as Beers, Nettleship, and others. Altho the clinical entity of Leber points to central scotoma and occurs in males, there are a number of cases reported that show the female to be affected, but in the minority of a number of given cases.

I wish to report three cases in two generations, namely the mother and two daughters affected, while two sons escaped. The patients are above the average in intelligence, well nourished, with a negative history for any hereditary defect, except for poor vision. The pituitary and posterior ethmoids and sphenoids were X-rayed, in all three cases and found normal. Wassermann (blood) negative. All general physical findings were normal.

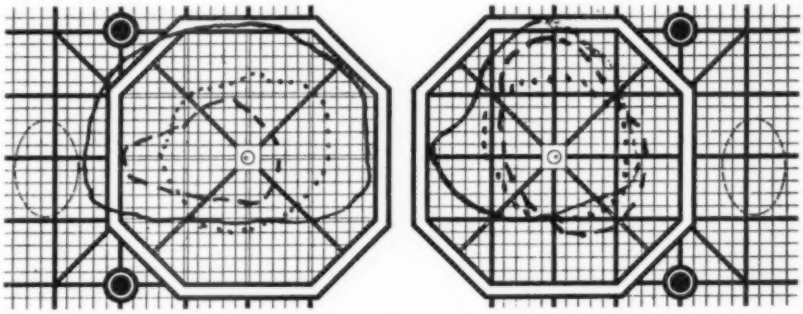

Fig. 1. Fields for Case 1, June 29, 1915. Dotted line red, broken line blue, solid line green.

CASE 1. Mrs. R. W., age 28. First consulted me June 29th, 1915. Vision: right 15/200, left 6/200; with correction, right minus 1.50 cylinder axis 180° equals 20/100, left minus 1.50 cylinder axis 5° equals 20/100. Ophthalmoscopy: Both eyes vitreous clear. Discs very pale, margins well defined, lamina cribrosa slightly visible. Both arteries and veins very small, no macular or peripheral lesions. The visual fields were about normal for form but showed a marked contraction for all colors down to about 10 degrees with a central scotoma for blue.

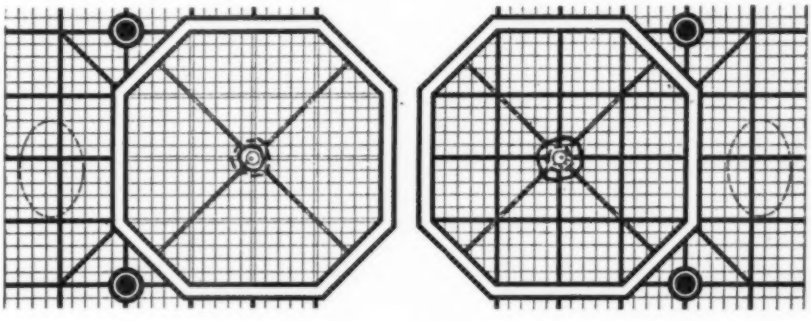

Fig. 2. Fields of Case 1, August 9, 1926. Lines as in Fig. 1.

Upon reexamination August 9th, 1926. Vision: right 5/200, left 5/200, with correction, right minus 1.50 cylinder axis 170° equals 20/200, left minus 1.50 cylinder axis 175° equals 20/200. Fundi showed discs very pale. Blood vessels seemed more atrophic, otherwise fundi about the same as last examination. Fields showed a paracentral contraction down to the 5 degree area with no central vision for blue or red and questionable green.

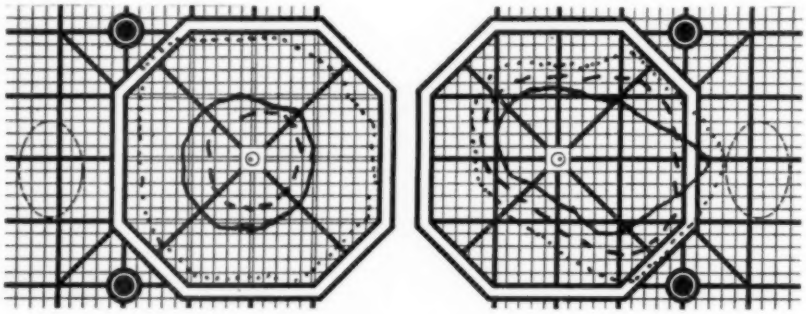

Fig. 3. Fields in Case 2, August 9, 1926. Lines as in Fig. 1.

Case 2. Miss L. W., age 14, daughter Mrs. R. W., August 9th, 1926. History: Poor vision, failing rapidly past 4 months. Past history: Has always been a very robust child and has not had any serious disease. Began menstruating at age 13, no difficulty. Otherwise history negative. Present history: Has had frequent headache on close work past four to six months. Is unable to read more than a few minutes at a time. Vision: Right 6/200, left 6/200; with correction; right plus 2.00 sphere combined with plus 0.50 cylinder axis 90° equals 20/200, left plus 2.00 sphere combined with plus 0.50 cylinder axis 90° equals 20/100. Fundi showed media clear, discs pale, well defined slight central cupping, lamina cribrosa visible, vessels round in contour and size, macula and periphery normal. Both fields full for form but contracted for all colors to within 10 degrees, and somewhat irregular in the left eye.

Case 3. Miss F. W., age 9, daughter of Mrs. R. W., August 9th, 1926. Present complaint: Mother states past year child has complained of poor vision and she observed this reflected in her school work. Past history; irrelavent as to any bearing on present trouble. Examination: Vision: right 10/200, left 2/200; with correction, right plus 4.00 sphere equals 20/30—1, left plus 4.00 sphere equals

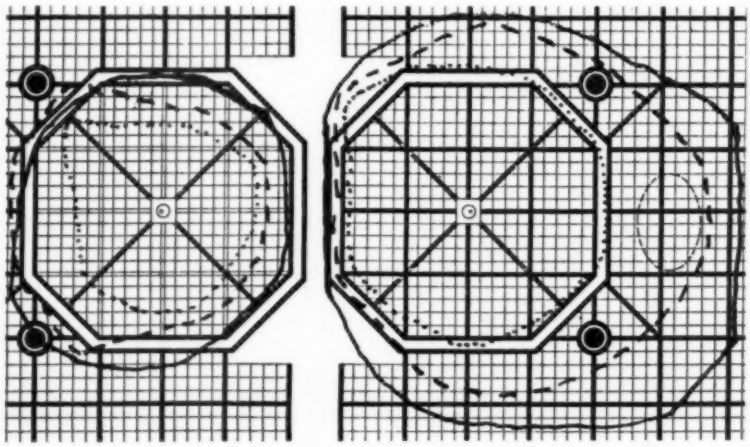

Fig. 4. Fields of Case 3, August 9, 1926. Lines as in Fig. 1.

20/200. Fundi shows media clear, discs pale, blood vessels normal, macula normal and periphery clear. Fields normal for form. For color, right contracted to within 20 degrees and left contracted to within 10 degrees. Red and blue contracted within green field.

Any effort to determine the etiology of this disease up to the present time must be conjecture or speculation, as up to this time there has not been reported a section of an eye which was diagnosed hereditary optic atrophy.

Pollock, Zentmayer, and Fisher have reported several cases with enlargement of the sella turcica. Some authors have found changes in the sphenoid to which they were inclined to attribute the disturbances. It seems if this type of retinal change were due to pituitary change or sphenoiditis there would not be the peripheral form field retained as it is. That it might be an endocrin disturbance seems rather a plausible theory which some have advanced, or an hereditary weakness of the nerve itself that would be more susceptible to the body toxins or some endocrin disturbance.

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NOTES, CASES, INSTRUMENTS

ASSOCIATED MOVEMENT OF JAW AND UPPER LID (JAW WINKING).

EVERETT L. GOAR, M.D.

HOUSTON, TEXAS.

A. W., girl, age eleven, consulted us because the school nurse said she had poor vision. When the child was five her mother noticed that when she opened her mouth, especially upon looking down, the upper left lid was elevated. Her vision was R. 20/30—2, L. 20/100—1. Her refraction under cycloplegia was R. + 0.75S

Fig. 1. Drooping of lid on opening mouth and looking down.

Fig. 2. Right palpebral fissure narrower when looking up.

$\bigcirc$ + 1.00 C X 150 20/20; L. — 1.00S $\bigcirc$ + 1.75 C X 45 20/30 — 1/2. There was no ptosis tho she could not open the left eye quite as widely as the right, and as she looks up the left palpebral fissure is scarcely as wide as the right. She had orthophoria for distance, 3 degrees of exophoria for near, n. p. c. 60 mm. Diplopia could not be induced in any direction of gaze. As the patient looks down and opens her mouth the left upper lid is elevated

Fig. 3. Left upper lid jerked up on opening mouth with eyes turned down.

with a sharp spasmodic jerk. No other anomaly could be found. This is a case of the rather unusual phenomenon known as jaw winking.

This condition was first described by Marcus Gunn when he presented a case before the Ophthalmological Society of the United Kingdom in 1883. George Sym in the Ophthalmic Review of July 1908 says: "There does not appear to be any other probable explanation of this curious association than that in some inexplicable way there arises some confusion in the joining up of fibers and cells belonging to the fifth and third nuclei in such fashion that the levator receives less than its normal innervation, and there is, therefore, a certain degree of ptosis (tho this is not a necessary part of the error), but there is no paralysis of the muscle, which is capable of full contraction; at the same time, the levator receives some fibers which were intended for the external pterygoid or the diagastric, and when that muscle is put in action, at all events when put strongly in action, the levator is unintentionally innervated, producing the curious effect described."

The condition is usually associated with ptosis and I report the case because of its rarity and of its obscure etiology.

1300 *Walker Ave.*

CONJUNCTIVITIS AND DERMATITIS DUE TO BUTYN.

F. H. Newton, M.D.

DALLAS, TEXAS.

In the February issue of the American Journal of Ophthalmology, Dr. Albert N. Lemoine reports a case of conjunctivitis and dermatitis due to butyn. We have in our care now a similar case. Examination of Mrs. V. A. W., age 66, showed in July, 1924, a bilateral glaucoma simplex. Local treatment with miotics was instituted, a solution of pilocarpin containing one grain each of butyn and dionin to the ounce being prescribed for the patient to use at her home in another town.

The patient failed to return for observation until October, 1924, giving as a reason for her absence a marked dermatitis of eyelids and adjacent portions of the face. During this interval she was being treated by a dermatologist, but stated she was quite faithful in using the "drops" in her eyes. There was present at this examination a marked dermatitis of eyelids, extending to the skin of the face and associated with a decided injection of the conjunctivae. Thinking possibly the dionin was influencing the skin reaction, a solution of pilocarpin was given, the butyn being left out, but not suspected. On January 15, 1925, patient returned, stating the conjunctivitis

and dermatitis cleared up completely, in a week after her last visit.

On this date anesthesia with 4% butyn was used for taking the tonometric reading. Pilocarpin and eserin also were instilled. In thirty minutes a marked redness and moderate swelling of the lids developed, with a decided conjunctival injection. This was attributed to the eserin. On her next visit, January 30, 1925, the patient stated the last reaction lasted three or four days. On this date the tonometer readings were made under butyn anesthesia, but no other instillation was used. Somewhat to our surprise and to the annoyance of the patient, the decided reaction of previous treatments occurred within thirty minutes. This passed off within three or four days, and has never returned since butyn has been discarded.

Mercantile Bank Bldg.

SUPPURATIVE TENONITIS ARISING FROM DORMANT CORNEAL INFECTION.

WM. H. CRISP, M.D.

DENVER, COLO.

Miss L. B., aged seventeen years, was referred to me on September 2, 1926, on account of extreme proptosis of the left eye, which had been developing since the 27th of the previous month. There was great exophthalmos, with enormous swelling of the lids, so that the eyeball could only be examined by raising the upper lid with an elevator. The tension of the eyeball was apparently at least 42 millimeters of mercury. Pain was intense. The eye had had very little vision since an injury by a piece of coal four years previously. The old injury had left a bulging white corneal scar toward the lower outer side, five millimeters in diameter. For several days, under observation at the hospital, the temperature by mouth varied from 99 to 100.6 degrees. On September 3, multiple punctures were made deeply thru the edematous conjunctiva, but without obtaining pus. X-ray examination and Wassermann test were negative. On September 5, the patient experienced relief which coincided with a beginning discharge of pus from the conjunctival sac. As the swelling subsided, it was possible to discover a firm slough which protruded thru a straight slit one-third of an inch long in Tenon's capsule, a quarter of an inch above and slightly to the outer side of the cornea. This slit did not correspond to the location of any of the punctures previously made. After the exophthalmos had, in the course of about a week, entirely subsided, the eyeball steadily shrank. With the more detailed inspection then possible, there was a rather definite line of continuity between the site of the process beneath the capsule of Tenon and the old corneal scar, which now had a definite yellowish tinge. It has not so far been possible to obtain this greatly disfigured eyeball for study, but it seems probable that a dormant infection in the corneal tissue was in some way activated so as to give rise to the virulent infection within Tenon's capsule.

530 *Metropolitan Bldg.*

SOCIETY PROCEEDINGS

ROYAL SOCIETY OF MEDICINE OF LONDON.

Sections of Ophthalmology and Neurology.

Joint meeting, February 11, 1927.

MR. ERNEST CLARKE, CHAIRMAN.

Value of Recent Methods of Treatment in Ocular Syphilis.

MR. J. HERBERT FISHER opened the debate. He first passed in review the different methods of giving, or using, the essential drug, mercury, and the supplementary use of iodid of potassium for the later manifestations. But practitioners at a later date seemed content to administer grey powder in tabloid form. Unless these pellets were crushed before being swallowed, they were often passed as taken, unaltered; and iodid of potassium was given in too many cases in only 3 to 5 gr. doses, when 30 grs. was nearer the requirement. He thought such a discussion as this should help a closer working association between ophthalmic specialist, physician, neurologist and general surgeon. In some cases of enlarged glands, arthritis and bone disorders which were regarded as tuberculous could have been seen to be syphilitic, if the eyes had been examined.

Ehrlich's discovery of salvarsan and neosalvarsan seemed to have eliminated the dangers of the optic atrophy, which had followed the use of the earlier atoxyl and soamin. The trouble was that salvarsan, or neosalvarsan, were too often regarded as sufficient in themselves, and mercury was erroneously left out of account. The Wassermann reaction was not infallible, it was indeed but a supplement to the well established methods of clinical observation. The difficulty of obtaining the original arsenical preparations led to many attempts being made to manufacture substitutes, some being apparently even innocent of arsenic. With the establishment of numerous V. D. clinics thru the country, which were largely resorted to, the disease was better understood and observed, and the public had gained a better idea of its ravages. Cases of ophthalmia neonatorum were becoming more rare in hospital practice.

In the late manifestations of syphilis in the eye he would include iritis (sometimes the nodular variety), scleritis, disseminated choroiditis, interstitial keratitis; these apart from the disease in which the ophthalmologist joined forces with the neurologist, ophthalmoplegia. He would also include diffuse neuroretinitis with dust like opacities in the vitreous. This was now less frequent, he thought, than 30 years ago, perhaps because of more thoro treatment of the primary stage. In secondary syphilitic iritis, the new injection treatment had been of the greatest assistance in preventing damage to the eye, probably because the antidote was brought into direct contact with the vascular iris. Interstitial keratitis from acquired syphilis he had not seen earlier than five years after the primary infection; it might not occur until 15 or 20 years after. As contrasted with the case of inherited syphilis, he had not seen the second eye attacked when the disease was acquired. In interstitial keratitis from inherited syphilis, there was no evidence that treatment by either the older or the newer method arrested, or even modified the progress of the disorder.

It would be interesting to hear, from the neurologist concerning the present frequency of tabes and of primary optic atrophy in locomotor ataxy. In regard to the last named, he had been impressed with the way in which well conducted mercurial treatment would delay the advance of the atrophy of the optic nerve fibers, especially if a fair visual field had been preserved. He had seen the Argyll Robertson pupil phenomenon disappear, under mercurial treatment. Aneurysms might also be expected to be less frequent now, also sclerotic changes, due to the disease, which resulted in nuclear palsies and other focal lesions.

Gummatous meningitis had always been amenable to mercurial administration.

Summarising, Mr. Fisher said the modern methods enabled more rapid control to be obtained of the primary and secondary manifestations of the disease. In regard to the eye, they were particularly useful when the disease affected the vascular tissues of the eyeball. It was hoped that the remote effects of syphilis (tabes and G. P. I.), would be less disastrous, now that the newer methods were being so largely used, and especially as patients were coming earlier, and more thoroly under treatment.

Discussion. Dr. Purdon Martin opened from the neurologic side. He said there were three main types which late syphilis of the nervous system assumed, tho in any patient these might be combined in varying degree. Syphilis might affect principally the parenchymatous elements in the main mass of the brain or spinal cord; and the common ocular symptoms were the Argyll Robinson phenomenon, and probably complete paralysis and irregularities of the pupil, in the absence of other oculomotor symptoms. Syphilis might affect principally the adventitious elements in the brain, causing what was known as cerebral syphilis, an accompaniment of which was, often, papilledema. The associated ocular palsies were not commonly of central causation. Or the disease might affect, primarily, the elements lying outside the main mass of the central system. He went on to refer to the external ocular palsies and primary optic atrophy. He had seen one case of optic atrophy in which it was likely the new preparations had done harm, and it seemed likely that the tryparsamide might precipitate optic atrophy. He considered that chemical treatment was of little avail in acute cases of optic atrophy. A positive Wassermann confirmed a diagnosis, but a negative Wassermann, in the blood of a patient of 50 or over, meant little.

Sir Arnold Lawson concentrated his remarks on optic atrophy, a condition which he had found to be almost hopeless from the treatment point of view. All one could hope to do was to arrest the progress of the atrophy. Organic arsenic compounds he regarded as harmful, while for mercury in this condition he had nothing but contempt. The only treatment which seemed to hold out any hope seemed to be large doses of iodides, but even this form of treatment was profoundly unsatisfactory. He believed the reason was that in primary optic atrophy one was dealing with a primary degeneration, as opposed to secondary degeneration following on the effects of active inflammation. It did not seem reasonable to expect a cure of optic atrophy, once the process had started; all one could hope for, was an arrest of it. He had found that at least 25% of cases of late syphilis did not give a positive Wassermann reaction, tho it was well known that the symptoms suffered from were due to syphilis.

Of 109 men admitted to St. Dunstan's, 62 had a positive Wassermann, 20 had a negative one, while of the remainder 27 were so bad that treatment was impossible. Most of the men had undergone intensive treatment at other hospitals, before coming to St. Dunstan's. But it seemed to have made them no better than those who had not had such treatment. Many of the patients died; some had mental conditions, G. P. I., meningitis. He had come definitely to the conclusion that one could not hope to arrest this optic atrophy by chemicals, and that the sooner that idea was relinquished, the better would be the results attained. In this disease sufficient recognition had not been made of the great mainstay of all treatment, skillful scientifically applied rest. It was valuable in all forms of impaired function. The hope, in his view, lay in securing these cases of primary optic atrophy early, and giving them sound sanatorium treatment, on the lines adopted for tuberculosis.

Mr. S. H. Browning spoke of having treated large numbers of cases of interstitial keratitis by the new methods, i. e., of salvarsan, neosalvarsan and bismuth. He mostly, however, combined this treatment with mercury.

These cases did better with intensive antisyphilitic treatment than without it. For tabes there should be a blending of the old treatment with the new. He had a good word for the Aachen treatment in the case of those able to bear the expense. He had had success in the use of bismuth instead of mercury.

Col. L. W. Harrison held a somewhat hopeful view of the treatment of interstitial keratitis due to congenital syphilis, a view which was supported by medical officers at treatment centers. At Rochester Row Military hospital there were good results obtained from subconjunctival injections of salvarsanized serum. He dealt with the treatment of syphilis in a general way, and spoke of the experiences at the St. Thomas' Hospital V. D. clinic.

Dr. Pines spoke of good results from sodium iodid intravenously, in late syphilis, especially in interstitial keratitis. None of the patients so treated showed iodism.

Dr. Gordon Holmes referred specially to the optic atrophy associated with postsyphilitic diseases (tabes and G. P. I.) He did not think optic atrophy invariably led to blindness; a considerable number of cases of optic atrophy of tabetic origin preserved their vision for years, especially under treatment. It had been shown that the essential lesion in tabetic optic atrophy in G. P. I. was an interstitial syphilitic process, associated with a primary degeneration of a certain number of nerve fibers. In a number of examinations he had confirmed this. There was a considerable interstitial change; a cellular infiltration in the nerve, generally passing in from the pia, usually along the small vessels, and so into the nerve. The lesion was nearly always found in the region of the optic thalmus, or at least it was most intense there. From observation of series of cases, treated respectively by mercury and arsenical preparations, he had concluded that the arsenical preparations were relatively ineffective. In order to secure results, treatment by mercury should be carried out.

Mr. Lindsay Rea gave accounts, with pictures of fundi, of a number of cases he had treated by the newer methods, and described the results.

Dr. A. Feiling dealt at some length with the subject from the neurologic standpoint.

Mr. Fisher in reply, said he felt convinced that thoro mercurial treatment delayed the progress of primary optic atrophy in tabetics. As a result of more thoro and earlier treatment, he thought the cases of congenital syphilis now seen were milder than formerly. He agreed with Sir Arnold Lawson's advocacy of measures to promote the patient's best possible state of general health.

H. Dickinson,
Reporter.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

Section of Ophthalmology.

December 17, 1926.

Dr. John H. Shellman, President.

Concomitant Convergent Strabismus.

Dr. Frank E. Burch read a paper, illustrated with lantern slides, on this subject.

Discussion. Dr. A. DeH. Prangen said he wanted to congratulate Dr. Burch on this very excellent paper. Under etiology there were several points that interested him. Like Dr. Burch, he used to feel that measles, whooping cough, et cetera, had nothing to do with the cause of squint. However, he had encountered these diseases in the history so often at the time of the onset of the strabismus that he could not help but believe that these childhood insults are at least precipitating factors.

Another point of interest to him was the occurrence of squint in children with very small errors of refraction. Dr. Prangen stated that he has quite a group of these children in whom the refractive errors range from a +.50 s. with a +.50 cylinder at 90°, up to a +1.50 sph. Altho small, the correction, where put on, had a very prompt

and decided effect. Most of them have straightened. Apparently the balance in these children is unstable and it does not take much to push them over into imbalance, or vice versa.

Regarding treatment, he was of the opinion that ophthalmologists ought to be more prolific in their dissemination of knowledge to the lay public and the profession in general, that these children should have early, prompt attention because the opinion is so widespread that they will outgrow it. Dr. Prangen thought it was largely the fault of the ophthalmologists that they get the children so late. The time to start treatment is when the squint starts. Another factor in treatment which interested him is the question of operating on children. He thought that they had been possibly too conservative; at least he knew he had. But one had to feel his way cautiously in this matter. He is of the opinion that they should interfere earlier than had been the custom in the past in the group which does not respond in reasonable time to proper measures promptly and efficiently applied.

As to the type of operation, Dr. Prangen wished to say here in Dr. Todd's shadow that he had seen more perfect results from the latter's method of tucking than from any other operation. He had seen two cases of Dr. Todd's with orthophoria; and Dr. Prangen had had one himself. He said that in Rochester they preferred resection, but there was much to be said in favor of tucking.

Another point Dr. Prangen wished to stress was the psychology of the cross eyed child. These children become hypersensitive, shrinking, bashful and diffident. Contact with others is avoided because of their physical deformity. If these mental traits are allowed to take hold they will lay the foundation for an inferiority complex in adult life; thus the child will be hampered thru life in his efforts to successfully combat his environment. These children should be pushed and encouraged to get out and forget their deformity.

Dr. Burch asked Dr. Prangen at what age they were operating in Rochester.

Dr. Prangen stated that it is their intention to sort out the ones who need operation rather than to pass all children by. He felt that they had been too conservative.

Dr. Douglas Wood said that he had enjoyed this splendid paper very much and there was little that he could add to it, but there were several points he would like to emphasize. If the child's eyes have been straight up to 1½ years, the fusion will come back if treated before the sixth year. After the sixth year there seems to be more trouble with the fusion and with keeping the eyes straight, even after operation. He had never been successful in keeping the eyes straight, if the eye had less than 6/60 vision. In regard to those children with strabismus who have a very low degree of refraction error, many of them will show a hyperphoria of a fairly high degree. They may show a weakness of the superior rectus on one side and very often one could get a good result by the use of a prism up and down.

In regard to the after treatment, he measured the refraction of those children under atropin and found, after a tucking operation, that very often there was an increase or decrease in the astigmatism. Each case is studied by itself. One can not treat them all the same. Dr. Wood said he tucked one eye up to 20 degrees and above that he operated on both eyes. He generally used a partial tenotomy with tucking. Where there was a divergence he was perfectly willing to cut the external rectus completely if necessary.

Dr. John Fulton complimented Dr. Burch upon the thoroness with which he had prepared his paper and said that he had added greatly to its value by recording the results of his vast experience in the treatment and operative procedures which he resorts to in the management of this class of cases.

Dr. Fulton first met Dr. Edmund Landolt at the International Congress in Washington in 1887, at which meeting Doctor Landolt read a paper upon

the operation for strabismus, in which he strongly urged the importance of muscular advancement associated occasionally with tenotomy of the opposing muscle. At that same Congress Dr. Fulton read a paper upon the advantages of early treatment and operation for strabismus, taking the stand that the amblyopia met with in this class of cases was due to nonuse of the squinting eye and could be overcome by exercise, glasses and early operative procedure.

In 1924 he had the great pleasure and privilege of meeting Dr. Landolt again at the Oxford Congress at which Congress he read a paper on the same subject, stressing still stronger the importance of muscular advancement as the operation of choice for squint. This paper was discussed by many of the ablest men in England, a record of which will be found in the Transactions of the Ophthalmological Society of the United Kingdom for the year 1924.

The discussion which made the best impression on him was that delivered by Dr. R. Beatson Hird, of Birmingham. His conclusions were from the analysis of 3,436 cases that he had treated. He pointed out that in a considerable number of cases squinting was due to an anatomic defect and in such cases the squint asserts itself from birth. He declared that tenotomy was not an operation to be entirely discarded; on the other hand, that it was absolutely essential in some cases. He favored suturing the conjunctiva so as to prevent sinking of the caruncle.

An operation by means of which such satisfactory results are obtainable, when correctly and carefully done, does not deserve such criticisms as that "all tenotomies are bad, only some are worse than others," or that a tenotomy is an indication of malpractice, or that a tenotomy of a muscle is equivalent to paresis. When a tenotomized ocular muscle is not completely detached from its connection with Tenon's capsule there is but little danger of secondary deviation.

We should all realize, in operating upon squinting eyes, that it is always a two eyed proposition, the object being not only to obtain complete parallelism but to bring about as nearly as possible normal functioning of both eyes. The amblyopic eye is usually the one of choice to be operated on, for the reason that if there is any stitching to the sclera to be done, it is not without danger of serious accident.

He stressed the point that orthoptic treatment is just as important in the after- and follow-up treatment as before operative procedure.

Dr. W. W. Lewis said he was glad the subject of "insults of childhood" and its relation to squint had been brought up. It is known that squint appears in the tired child. It is known, furthermore, that in adults after typhoid fever, pneumonia, or any general weakness, their accommodation lets go. It is not unusual at all to find an adult with relative loss of accommodation following a debilitating illness who rejects the plus glasses prescribed after recovery and returns to full health, being entirely fogged with them. Then, what is more easy to understand than the disturbed relationship between accommodation and convergence in children with poorly established fusion; if such a thing happens in the adult with well established fusion, it is easy to see how it could occur in children before fusion is firmly established.

He was of the opinion that what Dr. Burch said about tucking should be emphasized. He himself had never felt safe about resection and advancement. He thought the tucking operation, doing the maximum tuck first and supplemented by graduated tenotomy, was the safest operation at hand in connection with squint.

Dr. E. S. Strout considered this a very excellent paper. There was only one point he wished to discuss, and that was the behavior of the eye under the influence of atropin. He agreed with Dr. Burch that in many cases the squint is less pronounced after the eyes have been atropinized and these are the cases in which we may expect the greatest benefit from glasses. Dr. Strout called attention to the fact that there are exceptions to this rule, how-

ever, in cases of extreme hyperopia in which the squint may be aggravated by the use of atropin, and Dr. Strout had seen cases in which a squint became manifest after the use of atropin, in eyes that were parallel before its use. Recently a boy and girl from the same family were brought to him for examination. The boy had a marked convergent squint, but the girl's eyes showed no deviation. She was of school age and had been complaining of headache and other symptoms of eyestrain. Her vision without correction was O.D. 20/40, O.S. 20/30. Atropin was ordered for both children for five days after which they returned for examination. To his surprise the girl was then squinting as badly as her brother and the mother was very indignant over the treatment. Retinoscopy showed her to be hyperopic five diopters and the squint promptly disappeared with the use of glasses. It was his belief that in this case, the loss of accommodation from the use of atropin so reduced the visual acuity in eyes with five diopters of hyperopia that fusion was lost.

Dr. H. J. Rothschild thought that Dr. Burch had given one of the best papers ever presented before the Academy. It represented a great deal of work. In connection with the attitude of the French to surgery in strabismus, Dr. Rothschild said he was very much interested in the work that Dr. Magitot of Paris is doing. Dr. Rothschild happened to be in Paris in August 1925 and saw Dr. Magitot doing some tenotomies, and in the course of conversation Dr. Magitot told him that he had practically given up the muscle shortening operations and had gone back to tonotomy.

Dr. John Brown said he enjoyed Dr. Burch's paper very much. There was one thing that had occurred to him tho, which Dr. Burch did not mention and he had not seen mentioned any place, but had stumbled onto by accident himself. That was in regard to the after care in those cases where atropin was used, or had been used over a long period. In the eye that one desires to keep covered, instead of putting atropin in that eye or putting a bandage over the eye, Dr. Brown had used a smoked glass. He had a series of three grades of smoked lenses made, which could be put over the other lens. If ground correctly it may be slipped on over the other glass and held in place by a small metal clip. In the four or five cases he had tried, it had seemed to produce a very satisfactory result. Dr. Brown felt that the occlusion bandage as generally used has a tendency to defeat the effort of binocular vision. With a smoked glass the images are fogged, but there is still a possibility of coordinating the two eyes both for near and for distance. There is an attempt made to see with that eye and the patients are able to accommodate for near and look at picture books, read, etc. Dr. Brown said that he had never seen any reference to this use of a smoked glass in the literature.

Dr. R. O. Leavenworth thought that the value of broadcasting the importance of early examination in these squinting cases could not be over emphasized. Several years ago in the medical column of a newspaper, he had read where some mother had asked what she should do for her two year old baby who had squinting eyes. She was told to leave them alone. Dr. Leavenworth said he had often wondered how many eyes that one little statement had cost.

Dr. K. C. Wold said he wanted to ask Dr. Burch, in a case where there is a congenital anomaly, or disease of the fundus such as macular degeneration very early in life, how soon one is justified in operating; also, whether there is any advantage in waiting for the child to grow up?

Dr. Burch (closing) said that in presenting this subject he had not hoped to bring out anything new but he sincerely believed that this kind of a review of an old subject is quite as valuable to this Academy as something very new. He thanked the members for their generous discussion and said he was pleased to hear Dr. Leavenworth and Dr. Prangen emphasize the importance of educating the pediatricians and the public.

Dr. Burch said that certain figures have been given by Worth, showing the prevalence of squint among school

children to be about 2.4 percent. Barrie, of Glasgow, found also about 2 percent of children in certain districts of Scotland which he investigated, were squinters. The figure increased slightly above this to the age of 7 and then decreased gradually to the 13th year. So far as Dr. Burch knew, there are no available figures for the United States on this subject. If parents knew what could be accomplished when squint first makes its appearance it would lead to much better results from the standpoint of nonoperative treatment. About 40 percent of Dr. Burch's own cases had been corrected by simple measures. The figure would doubtless be very much higher if treatment could be instituted at an earlier period after the appearance of the squint. Among urban patients, if the pediatrician should see these cases early and would give the correct advice, Dr. Burch felt that 75 percent of squint cases would be corrected by nonoperative measures.

Dr. Burch's answer to Dr. Wold's question was that no age is too early to begin treatment. Dr. Burch said he had several patients under one year of age who were wearing glasses. Squint is rarely outgrown, at least he had not often seen patients with straight eyes giving a history of previous squint. In reply to Dr. Wold's comment, Dr. Burch said he had an experience with a child, the niece of a pediatrician, who obtained no benefit from visual correction. On her second visit the patient brought a note from the pediatrician asking "Have you overlooked anything in this case?" Dr. Burch then found the child had a very fine macular defect which he had overlooked, and doubtless in this case the correction of a relatively low refractive error will avail very little. Dr. Burch stated that in such a case he would want to defer operation until adolescence as there will be no attempt at fixation with this eye. Regarding squint associated with low refractive error, Dr. Burch said he had come to think that no refractive error is too low to attempt its correction when it is associated with squint.

Answering Dr. Strout's discussion, Dr. Burch said he would like to offer a suggestion that might explain his theory. In his experience it had so happened that after ordering atropin and finding the squint exaggerated when the child returned after three days, by continuing its use for a week longer one sometimes found the eyes had become quite straightened.

He thought Dr. Brown's experience with tinted lenses of varying density was a new idea worth following up, but Dr. Burch had followed Worth's teaching and usually used complete occlusion.

Dr. Burch said he thoroly believed in conservative eye surgery and felt that it is possible to operate on children too early; but on the other hand, if there is anything to the theory of favoring binocular single vision by early approximation of the visual axes, it would seem entirely logical to operate before the school age, after all possible benefits had been obtained by nonoperative measures. Whether one used a tucker or resected are matters of personal preference and experience. Dr. Burch said he still does a resection if the error is a high one, but whenever possible he did the tucking operation upon children because he regarded it as a safer procedure.

Dr. Burch said he wished to emphasize one other fact, namely, the correction of convergent cases by attention to the vertical deviation. In two cases recently, he had corrected some excessive convergent errors by the use of vertical prisms in children.

Dr. Burch wished to thank the members of the Academy for their discussion.

Walter E. Camp,
Recorder.

ST. LOUIS OPHTHALMIC SOCIETY.

January 28, 1927.

Dr. W. E. Shahan, Presiding.

Ocular Tests of Railway Employees.

Dr. Hugo Reim read a paper on this subject, printed on page 418.

Discussion. Dr. J. W. Charles said that about this question of substitution he might add that railroad men had

told him that on the day they were notified to appear, a man who could see well would go and be examined by the district examiner. He asked Dr. Reim what other things might happen in the way of substitution.

The question of low vision in railroad men brought up something he had read some years ago about the difficulty in prescribing glasses. The wearing of glasses was prohibited by some roads because smoke gets on the glasses in tunnels and makes a mist and can cause disaster in that way. As to the color test he thinks the Jennings test is the best; but he had always been partial also to the Adler's 98 pencils test. One takes these colored pencils and makes a red, green, blue and yellow mark, and then the patient takes a pencil and makes a mark on paper and matches what the examiner has put down in a horizontal line on a sheet of drawing paper. In that way there is a permanent record in a compact shape.

He asked under what circumstnaces the yellow light "caution" is used.

Dr. John Green asked Dr. Charles whether the pencil test he mentioned would eliminate the necessity of determining whether a person is color ignorant.

Dr. J. W. Charles answered Dr. Green's question, saying that there are a certain number of the pencils which he believes no one can place, since they are so vague in color; such as the dark blue, that will look black. Those they could match are the four primary colors. Have the patient make a line of these below the others on the card and one can get a good idea of the browns and dark greens, because the patient puts that one he does not know on this bottom line.

Dr. M. H. Post said that it is rather surprising to realize that three in every one hundred people are color blind, at least to some extent. He asked whether Dr. Reim is of the opinion that foggy, smoky atmospheric conditions have a definite influence upon color vision. Did Dr. Reim try testing by the use of lanterns with ground or smoked glass disks placed before them?

Dr. E. C. Spitze asked Dr. Reim what classes of railroad men he examined. In this question of substitution some railroads have a sketch on which they mark the color of the eyes, color of the hair, contour of the chin (square or otherwise) and the scars. The man then signs his name at the office where he gets his order for the examination, and at the physician's office, he signs his name again, three times on three different cards, and only one of the three does he carry. He does not carry back the examination report. That pretty well eliminates substitution.

Some mention has been made by Dr. Reim of engineers who are not allowed to wear glasses. That would eliminate many from road service because they have been in service many years; have developed presbyopia and need glasses. Some of these men are color ignorant. If given time and coaching they do better than at the first test.

Dr. F. E. Woodruff asked whether in this survey Dr. Reim had taken into consideration the field of vision. Dr. Woodruff recalled two cases, the first a train dispatcher, who had central vision in a 10° to 15° field. In the second case a street railroad motorman had a 15° to 20° central field. That would make it impossible for him to look ahead and see any child or small person approaching either side of the car.

Dr. Hugo Reim closing the discussion said that Dr. Charles had asked him about substitution, how could it be prevented; and Dr. Spitze had answered that question. There are many ways to prevent it. A photograph of the applicant may be attached to the application.

As to the prohibition of wearing glasses by engineers; Dr. Reim said that this railroad does not prohibit the wearing of glasses. Answering Dr. Woodruff, Dr. Reim stated that the fields of vision were not taken in this particular work. It was only a survey, and the examinations were hastily made. There was no time for a thoro examination tho it can easily be done in a car like the sketch he showed.

Regarding color variations in heavy fogs, the Williams Lantern, Dr. Spitze spoke of, is made for that particular purpose. It has foggy, smoky lenses that go over the particular colors for determining whether a man can still tell the colors. Sometimes when a man is suspected of being color blind the examiner gives him what is called a field trial in good and bad weather, rain or hail, or snow and also after dark and makes him point out the different signs and signals he sees. This is done on board a train and along the right of way. Men who are actually color blind can adapt themselves to the weather. They can tell a red light from a green as distinctly as many of us who have normal color vision, by the intensity of the light. Dr. Reim thinks these would be safe men in spite of being color blind. Many railroad men do not call lights by their colors, tho they know them. They will say a "stop light" or a "clear light," etc. So color blind men will also call them "stop" or "clear." A yellow light is used to show that everything is perhaps not as it should be ahead. It means that an engineer should proceed with caution, under control, until he finds the next light. The classes of men examined were engineers, firemen, brakemen, conductors, and switchmen. He found very many men color ignorant who with a little coaching would pass the test easily.

Removal of an Intraocular Foreign Body From the Lens Capsule.

Dr. M. H. Post presented the case of A. M. Jr., forty years of age, who first reported to his office Aug. 7, 1926, stating that the vision of the right eye had been failing for the past three months.

Examination showed, without crorection, O. D. vision hand movements at six inches, O. S. 18/12. The ophthalmoscope showed a pearly white cataract involving the entire lens and preventing any red reflex. Upon dilatation, the pupil was found to be irregular, due to adhesion of the iris to the anterior lens capsule in the horizontal meridian on the temporal side. The slit lamp showed a small black mass surrounded by a quantity of brownish pigment and apparently imbedded in the anterior capsule of the lens at the apex of this adhesion. The mass itself appeared to have a metallic sheen, but was very minute in size, about 1 mm. in its longest diameter. Repeated attempts to remove it with a powerful hand magnet failed.

On the 14th, a Zeigler knife needle was introduced into the anterior chamber and attempts made to dislodge the foreign body, but it still refused to respond to the magnet. After this it seemed best to open the anterior chamber and attempt to remove the foreign body with a portion of the capsule of the lens. A 5 mm. incision was made and the foreign body was removed, tho it crumbled into pieces and was lost as it was brought out of the eye. An iridectomy was made and the anterior chamber irrigated. Apparently the lens capsule was opened slightly. The lens failed to swell and a rather persistent iritis set in. This condition continued for two months. The eye was then reopened as for extraction and the anterior capsule was widely opened with Ewing's forceps. Gentle efforts to express the lens were unsuccessful even after repeated attempts had been made with a spatula to break up the adhesions formed with the iris. The lens was then well stirred up, the anterior chamber irrigated to remove as much as possible of the cortex and the eye closed. Atropin was used every two hours for the next few days. Slowly the remainder of the lens absorbed and the patient was discharged Jan. 20, 1927, with the eye entirely quiet and a clear pupil except for slight haziness of the cornea above and to the temporal side.

The case is of interest from several points of view. The inability to remove the foreign body by the magnet was due, in all probability, to the minute size of any portion which had not undergone oxidation.

The most interesting problem with regard to the case arose in connection with the second operation, as to whether a wide corneal incision with an attempt to remove the lens by ex-

pression should be made, or a small incision with removal of the foreign body and opening of the anterior capsule, allowing the cortex to be absorbed later.

The patient's age was rather against the successful outcome of this latter procedure, but an unfortunate experience some two years before in attempting to remove a traumatic cataract had suggested caution in trying any radical measure under these circumstances.

Peter Callan, in discussing the question "What is the age limit of discission?" states that the lens is absorbed up to thirty-five years of age and even later, tho from the eighteenth to the twenty-fifth years and there onwards the process is much slower, and goes on to say that "If the surgeon wished to rely on discission to remove a traumatic cataract, he should proceed with caution and thereby avoid complications. A second needling should be done in from six to eight weeks after the first, if the process of absorption has apparently come to a standstill."

Extraction may be practiced, however, instead of discission, according to the same author, in certain forms of soft cataract if they are of long standing, with little or no lens matter remaining within the capsule, especially if the cataract be due to traumatism.

Considering these various factors, it was determined to follow the more conservative course.

The final problem arose at the time of the third operation. The situation seemed rather desperate. There was very severe iritis, with almost certainly dense adhesions between the lens and iris, but it seemed that something must be done to try to control the inflammation. The eye was, therefore, again opened, as noted in the case report, this time with a view to attempting to break up the adhesions and remove the nucleus of the lens, which appeared too hard for absorption. It was found, however, to be extremely soft, the loop passing freely thru the lens substance.

The fortunate outcome by absorption after stirring up the lens thoroly seems to me a point of interest. Dealing with such cases in the future, I shall be inclined, even up to the age of forty years and beyond, to thoroly stir up the lens substance at the first operation, irrigating the anterior chamber freely to remove as much as possible of the cortex and allowing absorption to deal with the remainder of the lens substance.

Since presentation of the above paper, on Feb. 10, 1927, the patient was again examined and with plus 12.00 spheric, vision was 20/38. The keratometer showed .50 D. of astigmatism, vertical meridian and none could be demonstrated on subjective examination.

Discussion. Dr. J. W. Charles said that regarding the age of the patient at which a discission can be performed, he remembered an instructive case in the practice of the elder Dr. Green who made a discission on the eye of a deaf mute school teacher who had a fluid vitreous. The only good eye had become cataractous. The patient was certainly more than forty-five years of age. Dr. Green kept her at the hospital where she had to be led constantly. Dr. Ewing could tell us how many years Dr. Green "picked away" at that lens until she could tell the time of day across the room. She got along beautifully afterwards. Because she had a fluid vitreous, Dr. Green did not dare perform an extraction, but kept "picking away" until he got good vision.

Dr. John Green said that he hesitated to criticise the management of this case because the excellent visual result is in itself a justification of the course pursued. Dr. Post was evidently fully convinced of the presence of the foreign body and its location, hence did not feel it necessary to have roentgen ray made. Had he done so it is possible that no shadow would have been cast which would have given rise to the suspicion that the metallic bit had been completely oxidized. Apparently the large magnet was not used, and, as events turned out, it probably would have been no more effective than the small magnet. There is always the possibility that the foreign body may originally have been nonmagnetizable.

A lens harboring a foreign body, whether magnetizable or not, almost invariably becomes cataractous. In such cases Dr. Green believes it to be good practice to proceed as follows: Make a large preformed conjunctival flap and insert sutures; make an incision under the flap with a keratome or Graefe knife; perform an iridectomy; take a large bite of the anterior capsule (including the foreign body if possible) with capsule forceps; draw up the flap and irrigate out all soft lens material which will include the foreign body if it has not been removed by the capsule forceps. Thus will be avoided a lens protein reaction which he suspects was the cause of the prolonged iritis in Dr. Post's patient.

Dr. W. F. Hardy said that in the handling of these cases he thinks a number of things should be taken into consideration. First, he is rather opposed to ordinary discission; therefore, he feels it would be better to do a linear extraction, other things being equal. Secondly, he thinks it would be better to wait until the cataract matured and remove the two together. Thirdly, that all the cortex be gotten out at the original operation.

In connection with these remarks and substantiating them, he read the record of a patient treated by him in 1924. This man was 30½ years old, with a divergent squint since childhood. Vision in the right eye was very poor. Fixes with the left eye and uses it for all purposes. Seven weeks before coming to Dr. Hardy he was struck "a glancing blow in the left eye." The eye was painful for a few days, then improved. For the preceding twelve days he had noticed a defect in vision which became gradually worse. He was treated at the time of his injury by an oculist in Hannibal. No roentgen ray picture was made.

On examination there was no pain or redness. His vision had "slipped" in the last few days. It was 6/20 in the left, and fingers at 2 feet in the right eye. There was a small central corneal scar. O. S. No hole in the iris was made out. A piece of steel was embedded in the lens. The fragment could be seen by oblique illumination, and the lens was rapidly becoming opaque. With a minus 13 lens he was able to see 6/40 with the right eye. He was given a prescription for this and told to wait until the cataract was mature before removing the steel. That was in January. He came back in March and his cataract was very much more mature. It was removed. The lens came out nicely, and with it the steel in the lens. No lavage of the anterior chamber was necessary. The usual toilet was made. On April 23, he was able to go home. Convalescence was brief, quiet and without incident. The final result in this case was 6/4 vision. Dr. Hardy feels it was right to wait and attempt to remove the steel and lens at one time, and furthermore, wait until the lens was mature in order that as little cortex as possible be left behind.

Dr. H. M. Post in concluding the discussion said that no roentgenogram was made, as he felt certain that the cause of the disturbance was plainly before him. This he believes was a mistake, which fortunately resulted in no harm.

Possibly the situation was not handled in the best way. More radical incision with a greater effort at linear extraction upon the first attempt would probably have been wiser. He did feel that the cataract was thoroly mature at the time the patient first presented himself for examination.

It is quite possible that suction might have proved valuable.

Charles W. Tooker,
Editor.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

February 8, 1927.

Dr. E. D. Watkins, Presiding.

Gradenigo's Syndrome.

Dr. Richmond McKinney presented E. B., white, aged 7 years, who was brought into the clinic on December 14th, with a purulent discharge from the left ear, of more than one month's duration. The child appeared fairly well developed, and well nourished,

and had been up and about since the otitis began. The ear was cleansed with silver nitrate. The faucial tonsils were unusually large, and it was learned that the patient had had previous attacks of tonsillitis. The child had marked convergent strabismus. His mother was told to bring him back the next day for treatment of his ear.

On December 17th, a tonsillectomy and adenoidectomy was performed and the child made a normal recovery. While he was in the hospital his mother asked if removal of his tonsils and adenoids would straighten his eye. This question of hers led to more careful investigation of the child's history, and also to consultation with an oculist. The mother said that the child's left eye became crossed about two or three weeks previous to admission. There developed also a pain over the child's face, extending over the parietal region of the skull. Since the appearance of the eye lesion, there had been little change noticed in the eye or in the character of the pain. The child was sent to the eye clinic on December 20th; where the following report was made: 'Vision, both eyes, 20/20; complete paralysis of the left external rectus; both disc outlines a little blurred. The child apparently cerebrates slowly."

On the same day roentgen ray examination was made with the following report: The right mastoid was apparently normal; the left cells were almost entirely covered by fine haze, thru which the trabecules were discernible. The outline of the mastoid process was well defined. The laboratory report was as follows: white blood cells, 12,000, small lymphs, 49, large monos. 1, megaloblasts 1, poly. 44.

Turning test was made but revealed nothing abnormal.

On December 31st, a mastoidectomy was done on the left side with exenteration of the entire mastoid process to the tip. No dura or sinus was exposed. The diseased area extended backward toward the apex of the petrous bone, in the region of the semicircular canals. The ossicles were not disturbed. The posterior canal wall was found so necrotic that it was decided to remove this, and do a modified radical operation.

On the afternoon of the day of the operation it was noticed that the child's eye appeared perfectly straight, which was, however, attributed to either the anesthetic or the relief of the edema following the operation.

The child was in the hospital five days altogether. On the second day the outside dressing was changed, but the packing was not disturbed. On the fourth day the iodoform packing was removed; also the stitches. On January 4th, the patient was discharged to the O. P. D.

The mastoid incision healed satisfactorily and the external auditory canal was kept sufficiently open by means of packing. The pain, of which the patient complained, had entirely disappeared. The eye had improved markedly, and the report from the eye clinic January 23, was as follows: "Ocular movements aparently normal. Diplopia with a red glass was corrected by a four prism. This diplopia was increased by looking to the left. Eyegrounds were normal." The canal was now dry. On February 8th, at the time of this report, the eye appeared perfectly normal.

Discussion. Dr. Anthony had a case of Gradenigo's Syndrome which recovered. There was a large cell of pus under the horizontal semicircular canal.

Dr. Leatherwood saw the case before Dr. McKinney. He thought it remarkable how rapidly the eye condition cleared up. When he first saw the patient he was quite toxic and stupid.

Dr. O. M. Lewis said that the paralysis did not improve immediately after the operation, altho the squint did.

Dr. Shea said that Gradenigo's Syndrome did not supervene until the otitis had lasted at least one month.

Dr. McKinney said that loss of sensation was not necessarily a part of Gradenigo's Syndrome. In fact he had never seen one reported where this occurred.

Iritis and Secondary Glaucoma.

DR. E. C. ELLETT presented the case of Mrs. N. O., aged 65, who was seen first Nov. 3, 1926, with vision O. D. moving objects. With the left eye she counted fingers at six inches. There was mature cataract in each eye. The tension was normal. The right eye was operated on November 11, complicated by a vitreous loss and increased tension. During the convalescence two abscessed teeth were removed.

On November 19, an iridectomy was done on the left eye, the wound healing and the eye behaving very satisfactorily for fourteen days. At this time she appeared at the office with a painful, photophobic eye, which showed a subacute ciliary injection and increased tension. Search for a focus of infection was again instituted and four more diseased teeth were extracted. She had been hospitalized and given subconjunctival injection of adrenalin and hypodermic of 5 cc. sterile milk with the usual supporting measures.

Discussion. DR. STANFORD said that a focus of infection would not cause a glaucoma. He said that she was a difficult patient to examine and must have been very difficult to operate on.

Unilateral Exophthalmos.

DR. D. H. ANTHONY presented L.W., negress, aged 27. On April 6, 1925, the patient stated at Dr. E. C. Ellett's office that she had noticed that the left eye was a little forward for three months, much worse for the last two months.

The examination showed exophthalmometer reading, O. D. 19 millimeters. The left eye showed marked exophthalmos with ocular movements normal in all directions. There was no diplopia. Pupils were active as to light and accommodation; vision O. U. equalled 20/20 and Jaeger one. Ophthalmoscopic examination was normal.

June 25, 1925, exophthalmometer reading was O. D. 18½, O. S. 28½. Vision O. U. was 20/20 and Jaeger one.

July 13, 1925, he assisted Dr. E. C. Ellett in doing a left Kronlein operation to explore the left orbit. They both felt a questionable mass of very soft tissue. It seemed to encircle the optic nerve in the region of the apex of the orbit. They both thought it inadvisable to attempt to remove this indefinite mass. The wound was closed and the patient had no ill effect from the operation.

Since the above operation the patient had slowly developed more exophthalmos. Movements were still good in all directions. Vision was normal. Roentgen ray picture taken February 1927, showed a marked cloudiness in the region of the left orbit.

Discussion. DR. ELLETT said that he operated on this patient one year ago and found nothing in the orbit. It felt now as if there were some blood vessel tumefaction in the orbit, probably venous. He did not advise the Wyeth method of injecting boiling water. He advised the use of electrocoagulation.

DR. SHEA said that Dr. Lusk reported six cases of treatment of aneurysm by placing wires in the tumor and passing a current into the wires and thus coagulating the blood.

M. G. SELIGSTEIN,
Secretary.

CHICAGO MEDICAL SOCIETY AND CHICAGO OPHTHALMOLOGICAL SOCIETY.

February 23, 1927.

E. J. GARDINER, President.

Photography of the Fundus.

DR. ROBERT VON DER HEYDT said that photography of the fundus of the human eye has been so simplified by the construction of the new Zeiss-Nordenson Camera that it may now be put to practical daily usefulness and clinical application.

Dilation of the pupil and clear media are necessary. The magnification is about 3½ x linear depending upon the refraction. The two central spots seen in the picture are the unavoidable reflections of the microarc carbons.

The photographs of the fundus of which this series is a part are the first to be taken in this country.

Twenty-six plates of various fundus lesions were shown.

The Eye in Brain Localization.

DR. FRANK BRAWLEY read a paper on this subject published on page 426.

External Eye Diseases.

DR. E. R. CROSSLEY read a paper on this subject.

Discussion. DR. J. L. MILLER said that in this case he felt rather unqualified to present anything of great value. His interest in the subject of eye infections was largely confined, first, to examination of patients referred by ophthalmologists in order to determine whether there was a focus of infection, and second, the use of protein therapy in this class of cases. He had been interested in protein therapy for some time, and had followed the literature of what had been done in ophthalmic cases.

Usually the cases referred to him were choroiditis or iritis, and to examine a patient for a focus of infection, whether eye trouble or arthritis, was usually a gamble. If a focus was found, one could recommend that it be removed and then ask the patient to rap on wood. If luetic origin was suspected, one could have a Wassermann test made and find out if there was a history of lues or evidence of lues in any other part of the body. A negative Wassermann would not exclude syphilis, as syphilis of the aorta gave a positive Wassermann in only 60 per cent of the cases. For a comprehensive examination it was necessary to go over the patient to see if there was any other evidence of syphilis, or any history of chancre, hard or soft.

Tonsils presented quite a problem. If a patient had small tonsils without history of infection, he would advise that they be left. If small tonsils and a history of repeated attacks of tonsillitis, he advised their removal. If the tonsils were small and there was a history of tonsillar abscesses, he would urge that they be removed. Where the tonsils were large, without history of tonsillitis, it would be his policy to say that while he did not especially recommend or urge their removal, he would advise that this be done. Of course large tonsils with repeated attacks of tonsillitis should be taken out.

So far as teeth were concerned, he was of the opinion that the work of the men in the laboratories working with rabbits was misleading. They take a tooth with some absorption and find a number of microorganisms which have been enclosed for some time. These have probably lost their virulence and the patient has acquired a certain immunity to them. Then a culture from this tooth is injected into a rabbit which has not been immunized, and when an infection develops the tooth is blamed as a menace. That tooth might have nothing to do with the patient's trouble, but it would be better to have it out. The pulpless tooth was a different matter. There was some question whether cultures obtained from pulpless teeth were derived from contamination during extraction. Where the end of the root had been removed by going thru the alveolar process and using surgical cleanliness it was found that the culture was negative. Indiscriminate extraction of teeth might well reflect very seriously on the medical profession in the future.

In this search for focal infection, the sinuses should be gone over. The prostate should be massaged, and if any trouble was suspected, the patient should be turned over to the urologist. The patient should be advised to keep the bowels free. It was found in many cases that a patient with prolonged arthritis might develop a diarrhea, and the rheumatism might show marked improvement, only to return after the diarrhea had disappeared. There should not be indiscriminate operations on the gall bladder.

Drs. Mueller and Thanner in the year 1916 had treated a series of patients with iritis by means of an intramuscular injection of from 5 to 10 cc. of milk which had been boiled or allowed to simmer for ten minutes. Ophthalmologists had used milk very largely in the treatment of infections, while internists had employed typhoid

vaccine intravenously more frequently than anything else. In protein therapy it made little difference what protein was used if the temperature reaction was secured. Recently there had been a report on five hundred cases of eye infection treated by foreign protein. A large number of the series were cases of iritis, and it was reported that 60 percent of these were either cured or greatly improved after two or three intramuscular injections of milk. The results in parenchymatous keratitis were not so striking as in iritis, but on the whole were satisfactory.

Jacovides had reported results in a series of one hundred and fifty patients with corneal ulcer, one hundred and forty of whom were cured after two or three intramuscular injections of milk. Other series of corneal ulcers had been reported with very satisfactory results. In choroiditis the results were not so good, altho it was reported that 25 percent of the patients were greatly improved. It had been used with apparent good results in acute inflammatory glaucoma; with very good results in gonorrheal ophthalmia, 80 or 90 percent of the patients being very promptly relieved and corneal ulcer avoided; and with satisfactory results, altho the literature did not contain so many reports, in herpes of the cornea, and finally, in trachoma. Friedländer, 1916, reported forty-two cases with very good results. Since then there had been considerable difference of opinion. Huhn, in treating a number of children with trachoma, noted that following an epidemic of scarlet fever they showed remarkable improvement. Since then he had used milk, and claimed good results. Others had not had such good results.

From his own limited experience with iritis it seemed that there was no acute infection where foreign protein was used, where such striking results were obtained. The dosage began with from twenty-five to thirty-five million of typhoid vaccine intravenously, which amount would ordinarily give a good reaction; if there should be no reaction, the dose next day was larger, perhaps fifty million. The amount that would give a reaction was found, then the injection was repeated every four days, increasing the amount in each injection about 25 percent. This was necessary in order to get a good chill. If after two good reactions there was no benefit, he believed treatment might as well be discontinued. If, however, increasing improvement was shown after each injection, a total of four or five injections at three or four intervals should be administered. If after doses which gave moderate or good reaction there was temporary improvement but with a relapse before the time for the next dose, it was wise to increase the injection to one hundred million of typhoid intravenously. Occasionally prompt cures followed such a severe reaction when with moderate doses only a temporary improvement could be obtained. This dosage was not excessive, when it is considered that in paresis even up to a billion of typhoid was administered intravenously.

Dr. Robert von der Heydt mentioned that since the advent of microscopy of the living eye with the slit lamp, many new ocular differential diagnoses had been made possible. Some of the older signs and symptoms related by Dr. Crossley therefore needed a slight revision. One table shown stated the aqueous in glaucoma was sometimes turbid. This was never the case unless the glaucoma was due to iridocyclitis. It might appear that way thru a steamy cornea. With the slit lamp could be differentiated distinctly the opaque cornea and the optically empty aqueous. In iritis it was stated that there was normal tension or hypertension. Sometimes there was a reduction in tension. This is characterized by coarse foldings of Descemet's membrane. These remained for days even if the tension rose above the normal. Pneumococcus conjunctivitis was very common. The lids were sticky in the morning and there was often a bilateral involvement—at times an involvement of one eye only. One must be able to differentiate between the ciliary injection as a result of irritation of the ciliary body in pneumococcus conjunctivitis and that of very incipient iridocyclitis. In the

latter there was a distinct leucocytosis in the aqueous, while in pneumococcus conjunctivitis the aqueous was normal.

Dr. Goldenburg wished to accentuate the points of differentiation between superficial and deep seated diseases of the eyeball as made by Dr. Crossley, because of the seriousness of the one and the comparative absence of it in the other. In conjunctivitis the greater injection of the vessels was seen when the lower lid was retracted from the eyeball, whereas in disease of the cornea or the deeper structures the injection was more marked in the region adjoining the cornea (ciliary injection). If both were involved, there would invariably be found a zone between these two, of a lighter shade. A simple method of differentiation was to instill one or two drops of epinephrin, whereby the superficial vessels became blanched while the deeper vessels retained their injection, tho not to the same degree. Relative to the serious deep seated disease known as glaucoma, much had been said and written, so that the average practitioner recognized it quite early from its symptoms of severe pain and rapid loss of vision. The type that went undiagnosed was the noncongestive form, glaucoma simplex, in which all of the severe symptoms were absent. Patients might complain of seeing a ring or halo around a light, but the greatest complaint was of gradual loss of vision, which frequent change of glasses did not improve. Altho the necessity of frequent change of glasses might be associated with primary optic atrophy and incipient cataract, these conditions could be easily ruled out by the use of the ophthalmoscope.

He agreed with Dr. Miller's remarks on the promiscuous removal of teeth. Probably more conservatism was now displayed than had been the case a few years ago. Relative to the use of nonspecific proteins, this form of therapy was an excellent addition but should only be used when the etiologic factor could not be ascertained or in such cases as did not respond to the indicated treatment, or responded very sluggishly.

Dr. James Reeder said that the important thing was the early distinction between the intraocular infection and superficial condition. Many men were in the habit of waiting a day or two, which was often disastrous, as most oculists could testify from their own experience. A few hours or a few days might make a lot of difference. By that time the iris may have sealed itself to the anterior capsule of the lens. Dr. Crossley and Dr. Goldenburg had stressed these points to emphasize the difference between the two kinds of infection.

He did not agree with Dr. Miller and Dr. Goldenburg about the teeth. In the presence of a diseased eye every possibility should be eliminated that might tend to an unfavorable effect on that eye. If a pulpless tooth showed black under transillumination, with no other indications that tooth should come out. Sooner or later that tooth would cause trouble, perhaps in the eye, perhaps somewhere else, but why keep a potential source of infection? In his opinion it was not safe to keep a pulpless tooth in the head; cases frequently came to him with infected eyes or rheumatic symptoms. There might be nothing wrong apparently with teeth that were devitalized, but when they are extracted the patient gets well. Whatever the theory, the result was good. Doubtful teeth should come out.

Clarence Loeb,
Corresponding Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

November 20, 1926.

Dr. F. R. Spencer, Presiding.

Muscle Readjustments.

Dr. William C. Finnoff reported a case of transplantation of the outer half of the superior and inferior recti muscles and advancement of the external rectus.

M. M., aged 5, had been presented at the November meeting of 1925 with the diagnosis of congenital paralysis of the left abducens nerve or absence of the left external rectus muscle. At

that time he showed marked convergent squint and limitation of motion of the left eyeball at the median line and beyond, when rotating to the left.

The patient was operated on in August, 1926. A fibrous band which was a rudimentary external rectus muscle was found inserted just behind the equator of the left eyeball. This was advanced to within 6 mm. from the corneal margin. The outer one-half of the superior and inferior recti tendons were transplanted to the new insertion of the external rectus. Before transplantation, the tendon and muscles were split in the median line for a distance of 10 mm. A suture was passed thru the tongue of each resected muscle and they were tied together after the method described by Franklin in the Jackson Birthday volume. The untied ends of the sutures were then passed thru the advanced external rectus, from behind, as near to its new insertion as was possible, and tied.

At present, the eyes are parallel on forward gaze and the external rotation of the operated eye is from 30° to 45°.

Simple Glaucoma.

DRS. WM. C. and WM. M. BANE presented H. W. G., aged 45, who came because of failure of vision of two years duration. The right eye was noticed first. His distant vision was worse than vision for close work. No pain in the eyes. For years he has seen rainbow colors when looking at a bright light. It was found on examination that he was suffering from simple glaucoma. The tension in each eye was 66 mm. of Hg. His vision was 5/60 right and left. Pupils were 4 mm. in diameter. Pilocarpin was used which reduced the tension to 24 mm. in the right and to 31 mm. in the left.

The right eye was operated on by the Luedde technic on May 28, 1926, and the left eye by the same technic on August 10th. Each eye made an uneventful recovery. Glasses for continuous use were ordered on September 9th. Right eye — 1.00 sph. giving vision of 5/30 — 1; left eye — 1.75 sph. combined with —.25 cyl. ax. 85° giving vision of 5/7.5+. On examination November 17th, vision right eye with the above lenses was 5/30, left eye 5/6. Tension: R. 15 mm.; L. 20 mm. The fields of vision were taken previous to the operation and showed practically complete loss, except for central vision.

Uveitis, Vitreous Opacities.

DRS. WM. M. and WM. C. BANE showed E. R. S., who came on June 15th complaining of discomfort in the head and eyes. He had worn present glasses for five years which gave him 5/7.5 vision with each eye. Fundus examination revealed no pathology. Refraction was done with resultant vision 5/5 + in the right eye and 5/6 — 2 in the left eye. On August 9th, he returned stating that during the previous few days he noticed blurring in the left eye. Vision at that time, with glasses, R. 5/4; L. 5/10. Examination with pupil dilated revealed very extensive deposits on Descemet's membrane and floating opacities in the vitreous. He was given potassium iodid. Seven days later, vision left eye was 5/12. No improvement in the condition of his eyes. Mercurial suppositories were prescribed for use for a period of two weeks. He was not seen again until November 17th, at which time the vision was R. 5/5 +; L. 5/60. The urine was negative; Wassermann reaction was negative; and the sinuses were clear. The teeth were in good condition.

Swelling of the Optic Disc.

DRS. WM. C. and WM. M. BANE presented W. C., aged 10, who was first seen Nov. 25, 1921. Left eye had been defective since childhood. Vision R. was 5/5, L. 5/60. Fundus of right eye was normal. The optic disc of the left eye was elevated three diopters; vessels tortuous; margin of the disc occluded from view. The left eye had been kept under observation and was shown before the Society a year ago.

In the upper nasal portion of the disc is a striated white plaque simulating opaque nerve fibers which is probably scar tissue. Numerous small corkscrew vessels radiate from the disc upward and inward and also outward and downward, disappearing in

places and obliterated by the scar tissue. At a distance of two disc diameters in all directions from the disc there is a protrusion of tissue of a dark greyish color, elevated about three diopters. The remainder of the fundus is normal.

Vernal Conjunctivitis.

Dr. F. R. Spencer presented H. I., aged 8, who complained for the past two years of intense itching, redness, watering and photophobia of the eyes, beginning with the first warm weather in the spring and lasting until after cold weather begins in the fall. Vision: R. 6/6; L. 6/7.5 — 1. Examination: There was a slight redness and edema of the lids with some loss of cilia. There were irregular elevations about the limbus of each eye with injected conjunctival and scleral vessels about the elevations. The everted upper lids showed numerous flat masses. At times these are covered with a thin blue film. During cold weather, the lids look very much the same as they do in summer but the eyes are freer from the symptoms enumerated above.

Diagnosis of vernal conjunctivitis was made and zinc sulphate had been used at home in the proportion of one grain to the ounce; also dilute acetic acid in the proportion of five drops in 10 c. c. of water, to relieve itching. A green eye shade and heavily tinted glasses have helped to relieve the photophobia. Radium had been used several times during the past two years.

Discussion. Dr. William C. Bane had seen good results from the use of solutions of salicylate of soda.

Dr. G. C. Cary had seen two cases in patients sensitive to sage brush and cotton wood. The disease improved under use of extracts of these plants.

Dr. William C. Finnoff reported favorable results in some cases from the use of fibrolysin and radium.

Dr. G. L. Strader stated that vernal catarrh is rare in the territory around Cheyenne.

Absolute Glaucoma.

Dr. F. R. Spencer presented Mr. H. S. M., Sr., aged 65, merchant, whose chief complaint was poor vision for the past two days, feels as if looking thru a mist with the left eye. This history was obtained Feb. 20, 1926. Vision at that time: R. 6/20 — 1; L. 1/60. The anterior segment of the right eye was normal for a man of his age excepting that the anterior chamber may possibly have been a little more shallow than normal. The left eye showed marked pericorneal congestion. The patient failed to return for further examination and was not seen until September 27 at which time vision R. was 6/30 — 1 improved to 6/6 — 1 with a plus 1.50 sph. L. no light perception. The right fundus was normal; the left cornea was steamy and the lenses cataractous. It was impossible to get a view of the left fundus. The field of vision for the right was normal. Tension for the right eye was 28 mm. and the left 58 mm. with the Gradle-Schiötz tonometer. Transillumination of left was negative. Diagnosis of the left eye was absolute glaucoma.

He was given correcting lenses for the right eye and eserin to be used in each eye. The left eye has been quite painful at times. Eserin increased the pain so much that he advised its discontinuance for the left eye but he has used it quite faithfully in the right and has kept the right pupil from 2 to 2½ mm. in size constantly. On November 20th, tension right was 20 and the left 58 mm.

Foreign Body.

Dr. C. E. Sidwell presented E. P., aged 31, a baker, who came October 3rd, complaining of pain in his left eye following an injury the day previous. While hammering a bolt, something struck his left eye causing a streak of light, severe pain for a few minutes and some blurring. After the pain subsided vision directly in front of the left eye was clear but to the left was blurred.

The right eye was negative. The left eye was red and had a linear scar 2½ mm. long above and internal to the center of the cornea, a laceration of the iris 2½ mm. long at the upper margin of the pupil, with a tag of iris hanging. No scar was seen in the lens at first but when the pupil was dilated a scar in the lens was seen in the upper

and outer quadrant. Indirect ophthalmoscopy revealed a dark object in the vitreous, external to and below the disc. The roentgen ray showed a foreign body one millimeter in diameter in the vitreous, five millimeters beyond the horizontal plane of the cornea and five millimeters from the center of the cornea toward the temporal side and nineteen millimeters posterior to the center of the cornea.

One drop of 2% atropin was instilled every four hours and a 1/6000 solution of mercury oxycyanide every hour. October 6th, the eye was cocainized, the conjunctiva was opened along the lower border of the external rectus; Tenon's capsule was opened, and a stay suture passed for traction. An incision 4 mm. long was made thru the sclera with a Graefe knife. The curved point of the Sweet magnet was inserted in the direction of the disc and the foreign body removed with no difficulty. Two beads of vitreous presented and were severed with scissors. The wound was closed and a loose bandage was applied. Recovery was uneventful. Vision on November 16th with glasses was 20/32.

Discussion. Dr. William C. Bane pointed out that such an eye could not be considered out of danger for at least a year.

Dr. C. E. Walker approved of the plan of removal thru the sclera.

Dr. Wm. C. Finnoff said the prognosis must be guarded because detachment of the retina may occur later.

Foreign Body.

Dr. Wm. F. Matson presented W. B. P., aged 18, who was struck in the eye Oct. 23, 1926, by a particle of steel. The pain was intense for only a few seconds but the vision was blurred immediately. He was seen in about an hour, the eye was slightly reddened and painless. About two drops of blood were in the anterior chamber. The pupil was pear shaped with the apex below. No point of entry of the foreign body could be found. On the second day with the pupil dilated, no fundus details could be made out. At this examination a scleral scar was noticed 4 mm. from the nasal limbus. Roentgen ray localization demonstrated a foreign body 2x2x1 mm. in almost the exact center of the eye. The foreign body was removed by the posterior scleral route with the Sweet magnet. On November 4th, with the eye still under atropin the vitreous was clear excepting the part where the foreign body was located and a dark line where the foreign body had traveled from the point of entrance to its resting place. The eye is still quiet and not painful.

Discussion. Dr. Wm. C. Bane spoke of the importance of early roentgen ray examination and the value of mercury cyanide solution given subconjunctivally.

Dr. C. E. Walker stated there was no injury to the ciliary region.

Foreign Body.

Dr. James M. Shields presented a case of foreign body injury which occurred one year ago and which had been followed by recent detachment of the retina.

Metastatic Carcinoma.

Dr. James M. Shields showed a case diagnosed as bilateral metastatic carcinoma of the choroid which has not progressed during the past year but the patient had recently been losing weight.

Retinitis Pigmentosa.

Dr. Wm. M. Bane reported on three brothers with retinitis pigmentosa.

Vaseline in Anterior Chamber.

Dr. Wm. C. Finnoff reported a case of a bubble of vaselin in the anterior chamber which he had removed by paracentesis. The vaselin had gained entrance to the anterior chamber following its use on the lid margins after a paracentesis.

Donald H. O'Rourke,
Secretary.

OMAHA AND COUNCIL BLUFFS OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETY.

December 15, 1926.

Dr. A. R. Knode, Presiding.

Spasm of Retinal Arteries.

Dr. Dean reported a case in a girl of fifteen whom he was able to observe with the ophthalmoscope while the spasm was occurring. The patient

complained of seeing blind spots before the left eye and having words move while reading. Visual fields were normal. Ophthalmoscopic examination showed in the left eye branches of the upper temporal artery and one of the upper nasal artery in which contractions and dilations could be seen. During contraction the artery would be almost obliterated, the area of contraction moving considerably during observation. Nothing was found as the cause of the condition except chronically infected tonsils and a suspicious ethmoid which had not yet been taken care of.

January 26, 1927.

Contusion of the Globe.

Dr. Swab presented two cases. Case 1. A boy of eleven was injured with a clod of dirt. Vision of the left eye was counting fingers. Corneal abrasions and blood in the anterior chamber prevented a view of the fundus. Examination nine months later showed a large choroidal rupture in the lower temporal border of the disc surrounded by a ring of displaced pigment. Outside of this are some other ruptures of the choroid, extending beyond the disc and the periphery of the fundus below. A hole in the macula was present. Vision equalled counting fingers at five feet.

Case 2. A girl of fifteen received an injury to the right eye by wadding of a giant fire cracker on the fourth of July. Cornea was steamy and there was blood in the anterior chamber. The tension was increased. Apparently no light perception was present. The patient was hospitalized and a few days later when the blood had absorbed a large iridodialysis was seen at the temporal side. Six months later vision in this eye was 20/200. An area of iris atrophy corresponded to the site of the iridodialysis and behind this is a traumatic opacity of the lens. A hole in the macula was present and surrounding this was an area of grayish opacity.

Localization of Brain Tumors.

Dr. J. F. McDonald read a paper illustrated by slides showing case histories, visual fields, and cross and microscopic examination in typical brain tumors in different locations. The importance of upper temporal quadrant defects in localizing tumors in the temporal lobe was emphasized as was the importance of taking visual fields in all neurologic cases.

Discussion. Dr. Lemere asked if the former teaching that the papillomacular bundle is represented in the occipital cortex in both sides is still accepted as explaining the frequency with which the macular area is preserved in cases of homonymous hemianopsia.

Dr. Sanford Gifford described the frequent complication of localizing field defects due to a tumor with concentric contraction of the field due to pressure on the optic nerve and the necessity for distinguishing between them. He also mentioned some new work which offers an explanation of sparing of the macula. This is based on the findings that the posterior part of the calcarine fissure has a double blood supply and hence is more often spared from necrosis which involves the rest of the occipital cortex from a lesion which is not too extensive. This would not make necessary the assumption of the bilateral representation of the papillomacular bundle.

Sanford Gifford,
Secretary.

KANSAS CITY EYE, EAR, NOSE AND THROAT SOCIETY.

December 16, 1926.

Dr. J. W. Kimberlin, Presiding.

Symposium on the Differential Diagnosis of Orbital Diseases.

Dr. R. J. Curdy discussed the subject from the viewpoint of malignancies of the orbit. The diagnostic characteristics of primary malignant disease of the orbit, are those of well defined tumors of slow growth, with exophthalmos or lateral displacement, without pain or orbital inflammation, and are usually palpable. The exception is the rapidly growing small round cell sarcoma, seldom occurring except in childhood. Secondary tumors by extension from retinoblastoma, choroidal sarcoma, and sarcoma of the lids and conjunctiva, grow more rap-

idly, but are susceptible of diagnosis before involvement of the orbit. Only in those extending from the sinuses may the orbital condition have a part in the early diagnosis. Papillitis, retinitis, and optic atrophy are late symptoms except in tumors originating within the globe, and are less intense than when secondary to the inflammatory diseases. Sarcoma originating in the sphenoidal sinus may involve both orbits; other tumors of the orbit are limited to one side. All of the malignant tumors of the orbit are more frequent in the young, and the degree of malignancy is much higher in young individuals. All increase in size, tho often slowly, and end fatally unless removed by operation. Excepting in the cases of small round cell sarcoma, operation is usually practicable, and local recurrence improbable. Tumors within the muscle cone displace the globe directly forward, and produce progressive hyperopia, a distinguishing sign of tumor of the optic nerve. Tumors outside the muscle cone produce lateral displacement, with or without exophthalmos and are palpable. Tumors of considerable size are demonstrable by roentgen ray examination; those in the sinuses show by shadows and erosion of bone; those of the nerve which extend into the cranial cavity show alteration of the optic foramen. Metastatic tumors hardly ever occur except in the lacrimal gland, and these are associated with tumors of the same type in the salivary glands. Tumors from the brain may be endotheliomas or gliomas, and extend along the optic nerve, as do the retinoblastomas from the retina. Sarcomas from the sinuses originate in the periosteum and extend in the periosteum of the orbit. Sarcomas from the choroid and conjunctiva extend along the blood and lymph vessels and are pigmented. The other tumors of the orbit are without pigment.

Differential diagnosis of the primary orbital tumors from cyst or abscess is by absence of inflammation and of fluctuation, slow growth, firm consistence, and constant form and volume. Primary tumors of the optic nerve, whether originating in the pial or the dural sheath, are prone to surround the nerve, and produce identical symptoms. The nerve may be enlarged by involvement of its septa, or be free of infiltration and show only the changes due to pressure; in either case the clinical symptoms are the same. There is a strong tendency to mixed forms of overgrowth, especially to connective tissue hyperplasia. Many are classified as fibrosarcoma; in some the connective tissue is so predominant that they are reported as fibromas or as fibromatosis. These are characterized by slow, painless and noninflammatory growth; they are firm but elastic, not compressible, and not enlarged by congestion. The symptoms are exophthalmos, papillitis, and retinitis, followed by optic atrophy. There may be primary optic atrophy without preceding inflammation of papilla or nerve. Loss of central and peripheral vision accompanies the changes in the nerve and retina.

Dr. W. H. Shutz discussed the subject from the viewpoint of vascular disturbances. First he described the anatomy of the orbit and surrounding structures. Extravasation of blood into the orbit may be either spontaneous, due to hemophilia, scurvy, arteriosclerosis or sudden muscular exertion, or traumatic. The symptoms of hemorrhage into the orbit are extravasation of blood beneath the conjunctiva and into the tissues of the eyelids, exophthalmos and more or less limitation of motility. Occasionally the blood goes down into the nose and pharnyx with no other sign.

One may get a transient exophthalmos due to the distention of the orbital vessels under the stress of strong emotion or the hyperemia of menstruation. The intermittent type of proptosis is caused by stooping, compression of the jugular vein, forced expiration, etc.

Pulsating exophthalmos is either due to a vascular lesion in the orbit or cranium. The traumatic is usually due to a fracture of the skull. In the spontaneous, onset follows an unusual strain as parturition; fit of coughing, etc. Syphilis plays an important part in the etiology of these cases. If the

lesion is in the cranium it is likely to be an aneurysm of the carotid or an arteriovenous aneurysm. If in the orbit it may be a true aneurysmal dilation due to a diseased arterial wall or a traumatic aneurysm caused by an injury to an artery which might communicate with, and thereby involve neighboring veins, forming a varicosed aneurysm. In the spontaneous or idiopathic cases the appearance of the symptoms usually is sudden. Mixed tumors, partly angiomatous and partly aneurysmal, have been met with in the orbit. Occasionally we find a socalled plexiform angioma essentially venous in character, consisting of a convoluted mass of distended veins held together by loose connective tissue. The congenital variety of the pulsating angiomata may be confounded with a congenital encephalocele. Another form of vascular tumor in the orbit which may be confounded with true pulsating exophthalmos is a varicosed dilation of the ophthalmic veins or their branches. In the latter there is no pulsation or bruit and no symptoms of stasis in the orbit or eyeball.

Thrombosis of the cavernous sinus may arise from extension from the ophthalmic veins, the source of infection being wounds or septic infections of the skin, etc., or as a metastasis in infectious diseases or septic conditions. The symptoms are similar to those which present themselves in early retrobulbar phlegmon, viz., edema of the conjunctiva and lids, protrusion and immobility of the eyeball. Retinal veins are enormously distended. At the same time a doughy edema appears over the mastoid region. Anatomic examination in Graves' disease affords little evidence of the cause of proptosis.

Telangiectasis is a congenital vascular tumor, originally found in the lids, from which it may gradually extend into the orbit.

Discussion. Dr. James May called attention to the fact that if a patient presents himself with severe subconjunctival hemorrhage following an accident, and there is no evidence of contusion of the eyeball there is usually a fracture of the skull. He also mentioned four cases of sarcoma of the orbit all of which were seen too late to be operated on. Dermoid cysts usually are larger than they appear and are almost impossible of removal under local anesthesia.

Dr. Albert N. Lemoine said that the exophthalmos of hyperthyroidism may be so severe as to stimulate an orbital cellulitis. The chemosis may be so marked that it protrudes between the lids, and ocular movement be entirely abolished.

Dr. A. W. McAlister mentioned a patient who was struck in the eye with a board. There was a complete loss of orbital fat but two years later the eye was normal. Now the patient has an enophthalmos. He was unable to explain the cause.

Dr. Joseph McKee mentioned a case with exophthalmos which had no signs of infection which proved to be a round cell sarcoma.

Dr. Jess Cook said we may have tenonitis without any other parts of the orbit being involved.

Dr. R. J. Curdy mentioned two cases in the literature, developing orbital cellulitis, with fatal cavernous sinus thrombosis following minor operations on the lids.

Albert N. Lemoine,
Recorder.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

February 21, 1927.

Dr. W. G. Kennon, Presiding.

Retinitis Pigmentosa.

Dr. E. B. Cayce presented the case of Mr. S.M.L., aged 27, who when about ten year of age noticed some difficulty in playing indoor games, but had no trouble in seeing on the outside where the light was good. His vision interfered with his schooling in the primary grades.

The most significant fact in the family history is that the grandfather and grandmother on the father's side were second cousins, and the grandfather and grandmother on the mother's side were second cousins. He has one 18

year old brother who is in very much the same condition. He also has one sister 21 and another 24 who have normal eyes. The patient's mother and father both have normal vision.

Examination of eyes revealed a horizontal nystagmus, and slight divergence of the right eye. Otherwise the eyes are negative externally. Examination of fundi shows typical retinitis pigmentosa.

Arrested Juvenile Glaucoma.

Dr. E. B. Cayce reported the case of Miss L. G. When ten years of age she was fitted with glasses. At that time the vision in the right eye was very low. Dr. Cayce first saw her on Feb. 8, 1927, at which time she had some dscomfort in her right eye and was very much worried by the tendency of the eye to occasionally deviate outwards.

The cornea is 12mm. in diameter, while that of the left eye is 11 mm. The fundus picture is of marked glaucomatous cupping. The veins are dilated and the arteries are small. Only a faint outline of the lamina cribrosa can be seen. The tension in the right eye was 55 and that in the left eye was 35, with Schiötz tonometer.

The field of vision of the right eye shows a very marked contraction. Vision in the right eye is fingers at six inches and in the left 8/10 — 2. With a minus .50 cyl. ax. 90° vision is 10/10.

This case is interesting in that it was evidently a congenital glaucoma that developed drainage which arrested the buphthalmus.

Optic Tract Lesion.

Dr. R. J. Warner presented Mrs. J.D., aged 60, white, with the following history: About four years ago she had temporary loss of memory. At that time the blood pressure was over 200. After about three months her mental condition and blood pressure returned to normal.

In September 1926, the blood pressure was 140. Examination made by Dr. Warner on Feb. 1, 1927, was as follows: Blood pressure 170; vision right eye 20/100; left eye 20/200, unimproved by glasses. External examination was otherwise negative. There is a right homonymous hemianopsia with loss of reaction of the pupil when the left halves of the retinae are illuminated. Fundi are normal.

The impression was of a vascular lesion of the left optic tract.

R. J. Warner,
Secretary.

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OPHTHALMOLOGY IN GENERAL MEDICINE.

As students we all think of ophthalmology as a specialty in medicine that was highly developed in Egypt 3,000 years ago. In the last 100 years it has passed largely into the hands of a class of specialists—the oculists. As a rule it is considered an attractive specialty. Is it a line of work I would like to confine myself to? Occasionally one thinks he may specialize in that direction sometime and keeps an interest in it. But the majority decide otherwise and get to think of it as quite outside their spheres of practice and interest, ignore what seems to come to the oculist and forget what they partly learned in that direction.

This is not the true understanding of our profession. Modern medicine calls for team work. The undergraduate course on medicine is thought of as something that fits one for general practice; it has been planned to give certain knowledge that will be first drawn on when you have to meet the common emergencies of practice. But study in the medical school does not give you the wide experience of people and pathologic conditions that comes to be the peculiar possession of the general practitioner. In a way the general practitioner is just as much a specialist as the surgeon, or the experienced oculist. The family physician has learned more thoroly than any one else the diseases common in his field of practice, the habits of living, eating, sleeping, ventilation, amusement of the people among whom he practices; the family characteristics that mark not only the occupations but the diseases of different families that live in the same neighborhood; the individual idiosyncrasies, habits, tastes, desires, points of view that constitute the keeping up of each patient's health a separate and distinct problem. In short he must become the medical advisor of a certain group of human beings, with a knowledge, a skill, an association of resources to meet demands more strictly and more highly specialized than is required of any other specialist in the medical profession.

If you are going to study and perfect your knowledge in pediatrics or diseases of the chest you cannot know all the things the accomplished family physician knows. Today there are not truly general practitioners apart from specialists. There are only individual physicians each of whom has attainments and defects of education pecu-

liar to himself. There are points in the struggle to overcome disease in which each can help every other member of the profession; and there are other matters in which any other member of the medical profession can help him.

We have all come into a profession in which every individual member can have his own place and can rightly cooperate with his fellows. The highest achievement of medicine is team work, not the group organization that has offices in one building and pools receipts, but the team work which is essentially the cooperation of every member of the medical profession. Each consults and discusses his cases and difficulties with other members of the medical profession. He reads what they write and writes what he thinks they should know. The broad association and cooperation of minds chiefly devoted to separate fields of study and achievement is the latest phase in the development of the healing art. A part of medical literature needs to be devoted to extending, perfecting and ensuring such cooperation among all kinds of medical specialists. The outstanding difference between the quack and the member of the medical profession is: that the latter by tradition, training, ideals and social instincts shares in common resources, which no individual with attention fixed on his own ideas, claims and interests ever can command.

It is the proper function for an ophthalmic journal to help in connecting the thought of its readers with thought and activities of other branches of the medical profession. It is important for us to know what problems of diagnosis and therapeutics arise in other lines of practice that the oculist might help to solve. It is worth while for us to realize just what help we can give, and what we cannot do, in aiding to meet emergencies that are presented to colleagues working in other departments of the healing art. The discussion of such questions in medical societies and literature may be the best preparation to meet emergencies that are brought to us by cases that we do not usually undertake but in which our cooperation may be needed at any time.

His effective cooperation demonstrates conclusively that the oculist belongs in the medical profession, and that the general interest of those who seek medical assistance requires that such cooperation should be always available and promptly sought. The broad view of medicine taught to each of us in his student days must not be lost in the effort to develop into a specialist. The specialist in medicine must be a physician and something more. It is the quack, outside the profession, who seeks to be "something different and something less."

E. J.

BRIGHT'S DISEASE.

The centenary of Bright's discovery of the importance of the association of albuminuria with dropsy dependent upon disease of the kidneys is being commemorated by medical practitioners. It was in March, 1827, that Bright published the first report of his observations. Ophthalmologists should find, in this centenary, aspects of the life and works of Bright of special interest to themselves; because, after the invention of the ophthalmoscope, their use of that instrument constituted them the continuators of Bright's studies in the disease of the kidneys, with all its effects and consequences. The prominence of "Morbus Brightii" all but overshadowed the greatness of his other publications; therefore, it may be that but few know of the varied contributions he made to science; the range of the subjects being most extensive, touching on almost every department in medical practice in his day. All, however, have had constantly before them the knowledge of his great work in disease of the kidneys, because of the frequency of the association of disorders of vision with albuminuria.

Observers, before Bright's day, had been aware of the occurrence of defect or loss of sight in conditions producing dropsy, such as in the exanthematous diseases, in pregnancy and

during the puerperium. And, from the Middle Ages, dropsy and an altered appearance of the urine, that was coagulable by heat, had been observed. Yet, such symptoms had not been traced to their source, nor were they connected in the minds of medical observers with a diseased condition of any organ. Until Bright's discovery, no one had suspected the kidney to be the organ implicated. By his investigations of the state of the body of the dropsical, he ascertained that in all a peculiar condition of the kidneys was present, and he proved that the symptoms manifested during life were really those excited by disease of the kidneys.

The truths of his researches were soon recognized and the importance of them might be likened to the importance of Laennec's discoveries in the diseases of the chest. Bright, and his fellow workers, by 1837, tabulated the analysis of over a hundred cases; in a group in whom there were uremic manifestations, loss of sight was observed in four, and in certain of the cases the onset of amaurosis was one of the earliest, as well as the most striking, of the clinical features.

It was not until 1850 that the histologic changes in albuminuric retinitis were described by Türck. Soon afterwards Virchow attributed uremic amaurosis to gross disease of the retina, and in 1856, Heyman established the importance of retinal disease in albuminuria. It remained for Liebreich to give, in 1859, the first detailed description and representation of the ophthalmoscopic appearance of albuminuric retinitis, from which appearances it has been possible for us to diagnose the existence of renal disease.

Bright was born in Bristol, England, in 1789, and died in London in 1858, after a short illness, from long-standing disease of the heart. Therefore, within the year of his death, there were confirmed by the ophthalmoscopic picture of the ocular fundus, lesions comparable to those which he years before had seen only postmortem in the kidney; and, by the aid of the ophthalmologist, the practitioner was enabled to venture a prognosis as to the duration of life, from the visual and retinal changes demonstrable in the living eye.

BURTON CHANCE.

DIRECTORY OF THE AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS.

The publication of the list of those granted the certificate of the American Board for Ophthalmic Examinations together with a brief record of the medical applications of each and a short history of the Board and its purpose and methods gives an opportunity to express an appreciation of this endeavor.

Much credit can be given to the originators of this idea and to those who have so earnestly carried it out. A comparatively small group of men have devoted much time and energy to this work and by their loyalty have made this certificate a thing of great value.

The limited chances for systematic preparation in ophthalmology have forced the man desiring to specialize to seek his training from most heterogeneous sources; so that there has been no standard by which an ophthalmologist's qualifications could be even roughly estimated. The American Board has endeavored to set up such a standard and is succeeding even beyond expectation.

Tho the list of those passed by the Board contains only about five hundred names, and tho there are undoubtedly many times that number of competent ophthalmologists, it is becoming obvious that the list is containing year by year a larger percentage of the best qualified men. Naturally a well established physician does not desire the stamp of approval of any man or organization. But it is not for such a purpose that the eminently fitted men have submitted their names to this Board, but it is to indicate their cooperation, with those who are trying to establish a standard of fitness, for the guidance of others.

The very publication of this directory will help the cause, for it is going

to be a very useful little book. Never a week passes in a busy practice, but there is occasion to refer a patient to a confrere, in some other city. In the past, in those places where a competent oculist is not known to the doctor referring, it has been the custom to canvass the lists of the various national societies of high standing, in the hope of finding a qualified surgeon. But there is no doubt that the certificate of the Board, in as much as it is given solely in recognition of proficiency in ophthalmology, will be a more satisfactory evidence of ability, than membership in any society; and the list of those qualified will before long be our chief guide in selecting competent men.

The increase in workmen's compensation acts and the present tendency to carry every complaint to the bar, are forcing most large companies to use physicians more and more; and they will welcome an authentic list, which already means that the inclusion of a name therein is a guarantee of proficiency, and which will soon mean that the burden of proof is on the ophthalmologist whose name is not on the list. The book will serve also in making appointments in those hospitals and medical schools which desire staffs of those with highest qualifications. The keen interest of the chief national societies and the record of more than ten years of success, guarantees the permanency of this effort to designate the specially qualified, and so to stimulate the ophthalmologist to prepare himself to the best of his ability. L. T. P.

BOOK NOTICES.

The Nature of the Intraocular Fluids. W. Stewart Duke-Elder, M.D. Paper, Octavo, 140 pages, 5 illustrations. London. George Pulman and Sons Ltd. 1927.

This is the work of the Henry George Plummer Research Fellow, awarded the Sir Francis Laking Prize, from the Biochemical Department, St. George's Hospital, London. It is one of the series of monographs published for the British Journal of Ophthalmology. Its length and special character, make it unfitted for inclusion as an original paper in an ophthalmic journal, altho Graefe's Archiv which is often spoken of as a journal, has included many essays of this class. It is fortunate for English reading ophthalmologists that this series of monographs has been sponsored by the oculists of Great Britain. Much has been published of late years about the intraocular fluids, but chiefly regarding their bulk and disposal, as bearing on intraocular tension. This broader view of the subject may be found to advance the solution of the very problems that have been, heretofore, claiming first or exclusive attention in the literature.

Most appropriately this book takes for a motto the prophecy of Sir John Parsons: "Progress in ophthalmology must depend chiefly upon the application of new discoveries in chemistry and physics." Part 1 "Experimental" quotes from Baron Liebig: "History teaches that the commencement of every branch of science is nothing more than a series of observations and experiments, which had no obvious connection with one another." These show the purpose of this book which brings together observations and experiments in a way to show their practical connections. It takes up the chemical composition of the aqueous humor, normal and abnormal, correlating a large number of investigations that have been reported by others, and bringing them into relations that give them significance. The physical properties of the aqueous are similarly considered; specific gravity, refractive index, surface tension, viscosity and particularly osmotic pressure.

Part II is headed "Theoretical." It states leading points of the different theories, beginning with the theory of chemical equilibrium maintenance and variation of intraocular pressure, the plasmoid aqueous and theories of the nature of intraocular fluids. The evidence is stated and reviewed which supports the secretory theory, the transudation theory, the "neurogliogenic" theory of Magitot, and the "dialyzation" theory. While the au-

thor leans toward the latter he puts it as a working hypothesis and writes: "The literature of this particular subject will always remain a vast and portentous mausoleum to the Loyal Slaves of Theory. It forms a striking example of how transparently true is the saying of Demosthenes: "What we wish, that we believe," and of Aristotle: "What we expect, that we find"—in other words believing is seeing.

Part III is the bibliography which will probably surprise most readers by its extent. There are 656 references to papers all written within the last 150 years, and most of them since 1900 and coming down to the current year. The few papers contributed from America seem to be properly credited and there are ten that have been written by natives of Japan. This part makes the book a valuable work of reference. There is also a table of contents. The lack of an alphabetic index will be felt, because a wide range of subjects touched upon in the text and referred to in the bibliography are not easily hunted down without such an index. But ophthalmologists, physiologists, immunologists and other specialists in medicine will profit by the valuable work that has been done by this author. E. J.

Applied Refraction. Homer Erastus Smith, M.D., F.A.C.S., Assistant Surgeon Eye, Ear and Throat Hospital, New York City. Cloth, 8 vo., 140 pages. New York: William Wood and Company, 1927.

In as much as the greater part of an oculist's work consists of testing the visual acuity and prescribing the correcting lenses, any addition to our knowledge is welcome, whether it comes in the form of a review of known facts, a discovery of new principles or a description of the author's personal experience and conclusions. This book belongs to the latter category, and is intended chiefly for those who have a good knowledge of the subject which may be amplified and checked up by its data. It is well printed and unusually readable for a subject which ordinarily is presented in a dry and labored manner. It is rather unusual, however, to find the subject of skiascopy ignored. One would think that it has as much of a place in applied refraction as many of the other subjects which are: The Refraction Room, 3 pages; The Test Chart, 10 pages; The Trial Case, 3 pages; The Trial Frame, 2 pages; The Ophthalmometer, 4 pages; The Cross Cylinder, 3 pages; Taking the Visual Acuity, 3 pages; Cycloplegia, 5 pages; The Routine of Refraction Work, 3 pages; The Cycloplegic Correction, 6 pages; The Ametrope, 3 pages; The Myope, 3 pages; Astigmia, 7 pages; Refraction After Cataract Operation, 4 pages; The Post Cycloplegic Correction, 11 pages; The Use of The Improved Test Chart and the Non-Cycloplegic Correction, 3 pages; Refractional Changes Incident to Advancing Years, 2 pages; The Bifocal Lenses, 11 pages; Muscular Imbalances, and the Clinical Use of Prisms, 10 pages; The Mechanics of Visual Appliances, 8 pages; The Cosmetic Value of Glasses, 5 pages. In addition to the illustration of apparatus, there are 3 tables dealing with the relation of the age to the mean accommodation power and amount available, the horizontal and vertical effects of oblique axis cylinders and accommodation at various ages.

The book is a very practical one from which the reader may obtain much help for his daily work.

C. L.

This book is dedicated "To the memory of Dr. George Milbry Gould to whose skill and teaching I owe whatever skill I may possess in an art of which he was the master." That it should be so dedicated is most appropriate. It in no way imitates Dr. Gould's writings, but from a different point of view enforces one of his strong beliefs, that the importance of the accurate correction of errors of refraction is very great and has been imperfectly understood by many ophthalmologists.

The first sentence of the preface reads "This book is not written for the beginner in refraction work." Then follows a statement of what the

book assumes on the part of the reader; things that he must have learned by study and experience before he can profit by its perusal. But it would be equally true to say that for the ophthalmologist who has given years to the practical measurement of refraction, and perhaps feels that he has become an adept in it, this book is just what he needs to stir him to new thinking, new ideals of accuracy, trial of better methods of doing his daily work, and a broader conception of what may be done in the way of service to his patients.

The book is divided into twenty chapters. The first is headed "The Refraction Room"; and the point of attack is indicated in its first sentence "the writer believes that refraction work is a matter of applied psychology and that a severe mental attitude on the part of the patient is the first requisite." There is a separate chapter on the cross-cylinder, something almost unique in books on refraction. This shows no understanding that the best service of the crossed cylinder is rendered in determining the meridians of astigmia, the directions for placing cylinder axes; but in another there is reference to "a little trick" with the cross-cylinders which may sometimes be used to advantage to find if the position of the cylinder axis is correct.

In regard to cycloplegics the author, while having "no quarrel with those who do not use cycloplegics," states: "My own procedure is that any patient who has evidence of eyestrain (note this distinction) be he seven or seventy, shall be refracted under full cycloplegia." However, he seems to have full faith in homatropin as capable of producing full cycloplegia. But "homatropin used alone causes conjunctival congestion and is irritating. It must therefore be combined with cocain." Among the other chapters two that deal with important subjects usually neglected, are those on The Anomalies of Accommodation, and The Presbyopic Correction and Refractive Changes Incident to Advancing Years. The last two chapters go into a realm that is often left to the optician, but should be understood by the oculist. They take up the Mechanics of Visual Appliances and The Cosmetic Value of Glasses.

The peculiar value of this volume is that it gives a view of its subject from an individual point of view; and it is not a reflection of what others have seen from their view points. As the author states it: "This book is a record of personal experiences and from these I must hold to what they have taught me." They may not have taught him all that is to be known about applied optics, but they have taught some things that have not been effectively taught by other books. That is what makes this book worth while to read and to study. The new point of view it gives is worth knowing. The ideas it promulgates are worth considering. The methods it suggests are worth testing. If the reader cannot accept all that the book teaches, he may receive from it suggestions that will open up lines of thought leading to a broader knowledge, and sound conclusions.

E. J.

Diseases of the Eye. Sir John Herbert Parsons. Fifth edition. Cloth, 8 vo., 676 pages, 21 plates and 343 figures in the text. Macmillan Company, New York, 1927.

This is the fifth edition of the justly popular text book and has been revised with additions made necessary by our increased knowledge, especially relative to slit-lamp observations. In a book of this size the descriptions must be more concise and the subject matter more restricted than in the larger text books; but this handicap has not militated against the value of the book. On the contrary, on consulting it, there is not the necessity of sifting out of the mass of otherwise valuable information, the kernel which is desired. This is done by the author in a manner which combines readability with instruction. For this reason it is of especial value for the beginner, but those who have been in practice for a long time can also make good use of it.

C. L.

The 18 pages added to this edition include many brief phrases or sentences that give a new meaning to the text, and thus bring this standard textbook well up to date. There are also 17 more illustrations in the text, than were used in the fourth edition, and many of the original figures have been redrawn. The value of these changes is not indicated by the small additional space they occupy. Biomicroscopy, examination of the living eye with the "corneal" microscope takes its place, by references to the appearances thus revealed, in connection with the various lesions that are best studied by this method of examination. These references are indexed under "slit lamp." There are a dozen of them scattered thru the book; but only one of them, added to the chapter on external examinations, occupies a page, the others each consisting of a few words.

The general characters which have kept Parsons' Diseases of the Eye a standard work for twenty years, still give it permanent value. The 21 plates, 20 in colors, most of them representing 10 external diseases of the eye and 24 reproductions of ophthalmoscopic conditions, give it peculiar value to the student, or general practitioner, who has not a great ophthalmic experience. They are as well reproduced as in earlier editions, and will help to keep this work popular for years to come. E. J.

Laryngeal Tuberculosis. Frank Robert Spencer, A.B., M.D., F.A.C.S. Assistant Professor of Otolaryngology, University of Colorado. Gross Post Mortem and Microscopic Pathology by Philip Hillkowitz, B.S., M.D., Denver. Cloth, Octavo, 79 pages, 16 plates, 7 in colors. 57 illustrations. Philadelphia and London: J. B. Lippincott Co., 1927.

This is a good, condensed account of its subject, well illustrated and including a list of one hundred references to the literature, up to last year. It may be most generally valued for its colored plates, prepared under the supervision of the author, and giving 42 reproductions of the laryngoscopic appearances of cases. Yet it is a systematic treatise rather than a mere clinical atlas. The chapter by Dr. Hillkowitz, in four pages, gives an excellent account and interpretation of the appearances of the lesions, both as seen postmortem and in tissue surgically removed during life.

A careful study of this book will surprise the reader with the fullness as well as the clearness of its presentation of the facts regarding this dreaded and dramatic manifestation of tuberculosis. It well illustrates the emphasis of all teaching about this subject on the importance of early diagnosis. E. J.

Vorlesungen ueber Histo-Biologie der menschlichen Haut und ihrer Erkrankungen. Dr. Josef Kyrle, Professor of Dermatology and Syphilis University of Vienna. Paper, Octavo, 355 pages, 222 figures in the text, 82 in colors. Vienna and Berlin: Julius Springer.

The diseases of the skin of the eyelids furnish a share of the difficult and annoying problems of the ophthalmologist. A book that sets for the histopathology of skin diseases as this does, from the biologic standpoint may well claim his attention. Among the conditions here well described and strikingly well illustrated are: xanthelasma of the lids, blastomycosis of the skin, acne rosacea, angiomas, milium, molluscum contagiosum and xeroderma pigmentosum. The illustrations are all reproductions of microscopic sections of diseased tissues and adjoining parts and many give beautiful reproductions of the colors secured by various methods of staining. There is a good index, making it a practical reference book. E. J.

Essential Facts About Cancer. Robert B. Greenough, M.D., James Ewing, M.D., and Jonathan M. Wainwright, M.D. Cloth, 96 pages. American Society for the Control of Cancer. New York City.

This is a book for the medical profession, prepared by a special commit-

tee and approved by pathologists and surgeons. The headings of the chapters are: I. General Considerations. II. Early Diagnosis and Treatment. III. "Precancerous Conditions." IV. Carcinoma of Different Organs. V. Sarcoma. VI. Other Malignant Tumors. VII. Treatment of Inoperable or Recurrent Cancer. As cancer is seen by the general surgeon, it seems fairly complete, emphasizing the importance of early diagnosis and excision. But cancer in the eye is almost ignored. Melanosarcoma may occur "in the retina, choroid and other situations where pigment bearing cells are found." "Glioma" and "neuroepithelioma" are not mentioned, outside the central nervous system, and "retinoblastoma" is not mentioned at all.

E. J.

BIOGRAPHIC NOTICE.

Andrew Stanford Morton.

The form of ophthalmoscope most widely known as the Morton ophthalmoscope was an improvement of the Couper ophthalmoscope, so good that it has remained one of the most popular and convenient up to the present time. He was born in 1848. He graduated in Edinborough in 1874, and became an F.R.C.S. in 1888. His little book on "The Refraction of the Eye" was published in 1881, reached its second edition the next year and was, for many years, most popular among students trying to master that subject. He became Surgeon to the South London Ophthalmic Hospital and later to the Moorfields Ophthalmic Hospital, remaining Consulting Surgeon to the

Andrew Stanford Morton
1848-1927

latter institution until his death, April 11, 1927. He retired from practice in 1920.

He contributed numerous clinical papers to the Proceedings of the Ophthalmological Society of the United Kingdom, in the ten years following 1900, and in 1903, at the British Medical Association, read a memorable paper on the "Operative Treatment of Conical Cornea." The picture of him here reproduced, and the account of his work at Moorfields is written by a former student. He was a member of the Council of the Ophthalmological Society of the United Kingdom, 1886-89 and Vice-President 1902-5. The order of the Chevalier of the Crown of Italy was given him in recognition of his professional services.

E. J.

CORRESPONDENCE.

A. Stanford Morton at Moorfields.

To the Editor:

For many years the Royal London Ophthalmic Hospital (Moorfields), has been one of the leading training schools for those who desired to study diseases of the eye. In the early nineties the Staff consisted of Tweedy, Nettleship, Couper, Gunn, Lang, Morton, Lawford, Collins and Spicer. Each man served two days a week thruout the year, and at the age of sixty he retired to make room for a younger man. A. Stanford Morton was on the Staff of Moorfields from 1875 to 1909 and was one of the most skillful operators of his day. He was a modest, kindly man and deeply interested in the progress of his assistants. At his office in Harley Street he had them do iridectomies and cataract extractions on pigs' eyes. When they became proficient, he allowed them to do enucleations and minor operations in the Amphitheatre at Moorfields. I do not recall any other Chief who thus favored his assistants. The well known "Morton Ophthalmoscope" was invented by him. Dr. Morton lived in retirement at Bristol, England.

St. Louis. J. Ellis Jennings, M.D.

Physical Therapy in Ophthalmology and Oto-Laryngology.

To the Editor:

Physical therapy in diseases of the Eye, Ear, Nose and Throat is not new. The application of heat for acute inflammations, especially when there is much pain, irrigation for the removal of pus or other abnormal secretions, dilatation of stenosed natural passages, are applications of physical therapy long used and universally accepted.

There has grown up with some of the cults a very extensive physical therapy. Many of their treatments, viewed from a scientific standpoint, seem to have no anatomic or physiologic rationale. Some are undoubtedly harmful. Example, the digital treatment of posterior nares and orifices of eustachian tubes for deafness. This abuse of physical therapy has, I believe, prejudiced the regular medical profession against its adoption; and has been productive of the belief by many physicians that surgery and drugs are the great annihilators of disease.

Within recent years the armamentarium for rational physical therapy has been increasing enormously. Much of this is electrical, and some of the apparatus and methods quite complicated. A book of 307 pages has appeared on "Physical Therapy in Diseases of the Eye, Ear, Nose and Throat," by A. R. Hollender and M. H. Cottle, both otolaryngologists. (See v. 9, p. 852.)

What are we, the rank and file of oculists and otolaryngologists, going to do about these newer forms of treatment? We cannot afford to neglect methods of superior merit, even tho these methods are relatively new. A case came to my notice where treatment of chronic otitis media by several otologists was without relief and the patient finally cured by zinc ionizations, given by technicians in an institution of physical therapy. Some very encouraging reports are appearing in the literature of improved hearing following diathermy treatments for chronic catarrhal deafness, a con-

dition which has been recognized as very unsatisfactory for treatment.

Most of us are not mentally or financially fitted for reseach work. However, we should be eager to follow the results obtained by enthusiasts in the field of physical therapy. When some new method is proven to possess merit above that of the older methods of treatment we should become familiar with it and add it to our sum total of knowledge for combatting disease.

JOHN H. HARTER.
Seattle

Cyclodialysis.

To the Editor:

In the April 1927 number of the Journal, there appeared an article by W. A. Stoutenborough entitled "Cyclodialysis upon the Eyes of Rabbits." From an experimental study of the operation performed upon the eyes of fifteen rabbits, he drew conclusions of a most far-reaching character. These conclusions would tend to discredit the operation in its entirety. Possibly, the language in which the conclusions were couched was unfortunate in the phraseology; possibly, the author's conclusions were based exclusively upon the insufficient animal experiments reported; and possibly, the author has had little or no clinical experience with the operation in question. But certain it is, that the clinical results of cyclodialysis in properly selected cases of simple glaucoma belie Dr. Stoutenborough's conclusions.

It is to be hoped that a careful review of the published clinical experiences with cyclodialysis, combined with a realization of the fact that the experimental work was done upon animals in whom glaucoma never exists, will lead Dr. Stoutenborough to modify his condemnation of a procedure, that in the hands of experienced men has proven itself as a distinct forward step in the armamentarium of the ophthalmologist.

Very sincerely yours,
Chicago, Ill. HARRY S. GRADLE.

ABSTRACT DEPARTMENT

Reprints and journal articles to be abstracted should be sent to Dr. Lawrence T. Post, 520 Metropolitan Building, St. Louis, Mo. Only important papers will be used in this department, others of interest will be noticed in the Ophthalmic Year Book.

Banaji, B. P. Infections in Cataract Operations. Brit. J. of Ophthal. 1927, v. 11, p. 75.

Upon an experience of five hundred cataract expressions in which only one eye was lost by iridocyclitis, the author has formulated the following method to insure freedom from infections. After an experience of eight hundred intracapsular operations, he has abandoned it for the old capsulotomy method. The cases of the series were not selected and of all ages. As a preliminary, sixty grains of calcium lactate per day for two days were administered; two c. c. of hemoplastin is injected an hour before operations in case bleeding is expected. Eyelashes of the upper lid are cut and the lid border painted with iodin; the conjunctival sac is irrigated with mercury perchlorid. External canthotomy is performed as it gives a larger field, lessens the squeezing and the contamination of instruments, and affords complete drainage. For control of movement of the eyeball he uses Axenfeld's suture under the superior rectus.

The author attaches great importance to the use of a conjunctival flap; instruments once used should never reenter the eye unless resterilized; the point of the knife after making the section, if it touches the lid, should never come in contact with the wound; the size of the corneal section should be as small as possible, the corneal incision should be in that part covered by the limbus; replacement of the iris should be deliberate.

Milk injections are used when both eyes are operated on; when one has been lost, if operation is prolonged and when there is considerable blood and cortex in the anterior chamber.

D. F. H.

Lachmann, H. Olyptol in Ophthalmology. Klin. M. f. Augenh., 1925, Nov.-Dec., 75, p. 751.

The author reported favorable results in iritis, and relapsing opacities of the vitreous, with intramuscular (painless) injections of from 0.5 to 3 c. c. of olyptol which contains 10% turpentine oil, 1% eucalyptol and 0.5% eucupin in olive oil. C. Z.

Pesme, Paul and Deplanche, M. Passage of Fluroescein into the Anterior Chamber. Archiv. d'Opht. 1927, January, v. 44, p. 41.

Fluorescein seemed to enter the anterior chamber in iridectomized rabbits from the pigmentary border of the coloboma. Histologic study revealed that the fluorescein really came from prolapsed ciliary body and not from the posterior iris pigment epithelium, altho with the Gullstrand lamp this prolapse was mistaken for posterior iris epithelium in the living animal.

M. F. W.

Laignel-Lavastine and Bourgeois. Parinaud's Syndrome and Double Crossed Foville's Syndrome Following Encephalitis. Soc de Neur. 1927, Jan. 6. Abst. Gaz. des Hôp., 1927, v. 100, p. 210.

A woman of 30 had successively a left hemiplegia, paralysis of the right ocular rotators and a right hemiplegia with paralysis of the left rotators. Following the latter, there was a paralysis of upward movements. The cause was epidermic encephalitis.

C. L.

Pascheff, C. Symmetric Tuberculosis of Orbit and Lids. Klin. M. f. Augenh., 1926, v. 76, p. 646.

A man, aged 35, showed under the left lower lid in the lower part of the orbit a movable, small, hard tumor. The conjunctiva of the lower fornix was somewhat reddened. The tumor

was extirpated thru an incision parallel to the inferior orbital margin. It consisted of numerous tuberculomas of epithelioid and Langhan's giant cells. The patient had suffered since 1898 from numerous furuncles. One was excised and proved to be a follicular tuberculide. After eight and one-half months a tuberculoma below the right lower lid had developed, which was also removed. The apices of the lungs showed catarrh. The author considered the orbital tuberculomas as endogenous metastases.

C. Z.

Narayana Rao, B. K. Proptosis in a New Born Child. Brit. J. of Ophthal. 1927, v. 11, p. 79.

The author observed in a baby two hours after birth, the eyeball markedly proptosed and in contact with the brow above and without any covering by lids. After some difficulty both lids were hooked out forward and the eyeball went back with a snap into normal position and the lids covered the eye. Nothing abnormal was felt in the orbits. There was evident blepharospasm, the orbicular fibers having contracted behind the eyeball. Either during birth or sometime previously in intrauterine life, owing to sudden spasm of the orbicularis fibers and pushing of the eyeball forward, the lids contracted behind the ball over the optic nerve. Further observation was prevented by death at age of two months.

D. F. H.

Metzger, E. Clear Stripes in Corneal Scars (Fuchs). Klin. M. f. Augenh., 1926, Feb. 76, p. 202, ill.

By examination with the slit lamp, Metzger found in four cases a central vessel with distinct blood current in these stripes. He considers it most probable that in old corneal scars lipoid substances from the deep vessels reach the deeper corneal layers, which at certain distances from them accumulate, so that clear zones remain within the opacity corresponding to the course of the vessels.

C. Z.

Banister, H. Block Capital Letters as Tests of Visual Acuity. Brit. J. of Ophthal. 1927, v. 11, p. 49.

This investigator carried on a series of three experiments to determine the best letters to use as tests of visual acuity.

(a) Large angle block capital letters (Green's type) were exposed tachistoscopically, the whole alphabet being used.

(b) Selected large angle block capital letters of different sizes were exposed tachistoscopically.

(c) Selected small angle block capital letters were exposed on test cards for a long period.

The results of this investigation are illustrated by six tables.

Previous investigations as to the best letters for use in tests of visual acuity have led to discordant results.

From this inquiry it appears that the discordance is chiefly due to the fact that errors in naming letters have been assumed to be due to physical faults in the eye, whereas they are much more frequently due to psychologic causes: a given retinal image, e.g., of the letter "C," if not quite clear and definite being named "C," "D," "G," "O," or "Q" by a given individual for psychologic reasons which it is not possible to foretell.

These experiments indicate that the letters which are most suitable for use as test objects are those which are mistaken one for the other, e.g., C D G O Q and H K M N W.

It is also suggested that, when applying the tests, a tachistoscopic exposure of the letters may be found to be better than the present system of test cards which entails prolonged exposure.

D. F. H.

Weekers, L. Eye as Orbital Implant. Archiv. d'Ophtal., 1927, January, v. 44, p. 14.

It was noticed that an eye replaced in the orbit after evulsion by an accident remained in situ, altho recovering no function. With this in mind Weekers has had five human patients and made numerous animal experiments where he has used the enucleated globe as an autograft for a prosthesis. The globe is entirely freed and the optic nerve is cut. The cornea is then rotated out of sight into the orbit and the conjunctiva and rectus muscles are brought together over the exposed scleral surface of the globe.

Healing is good, pain is stopped, and a good motile prosthesis is obtained. Intraocular tumor or infection with the danger of sympathetic ophthalmia contraindicate the autograft. The first patient has been under observation seven months with a good result persisting. None of the grafts has been extruded. M. F. W.

Undelt, J. Sympathetic Inflammation. Klin. M. f., Augenh., 1926, 76, p. 825.

The right eye of a girl, aged 8, sustained from a blow with a pointed stick, a perforating wound of the limbus, 5 mm. long, with prolapse of the iris and injury to the lens. After four weeks sympathetic ophthalmia set in. Enucleation was done. A few days later the child developed scarlet fever, during the course of which the sympathetic ophthalmia subsided so that the child could be discharged cured nine weeks after the onset of sympathetic ophthalmia with vision = 1.

The anatomic changes of the enucleated bulb consisted of thick infiltration of the whole uvea with lymphocytes and plasma cells. The pathologic material of this eye was inoculated into the cornea, and with another series between the ciliary body and sclera into the suprachoroidal space of rabbits. It neither produced herpes or sympathetic ophthalmia, so that the author concludes, with references to the experiments of von Szily, that herpes virus cannot be considered as the morbid agent of sympathetic ophthalmia. C. Z.

Halbertsma, K. T. A. Congenital Macular Lesions. Brit. J. of Ophthal. 1927, Jan., v. 11, p. 11.

The author has found records of thirty cases of congenital holes in the disc, in literature. Only one, records macular changes. The case described, observed in a female, aged 38 years, showed an association of a hole in the disc with changes in the macular region, giving rise to marked alterations in the visual acuity, perception of colors and visual fields. Vision of the left eye was fingers lower temporal and only fingers in upper temporal fields. There was an absolute central scotoma and relative scotomata in upper and lower temporal field. The color sense was disturbed. The disc shows a crater like hole about one-fifth the diameter of the disc and about 7/8 D in depth. The sclera is visible at the temporal side, surrounded by heaped up choroidal pigment. In the area between the disc and the macula, there are numerous small yellow spots with many irregular pigment dots. The author believes that Van Lint and Van Duyse's theory explains the changes in the fundus and functions of the eye, viz., that at the entrance of the papillomacular bundle in the optic nerve, an abnormal growth of the retina has taken place, the abnormalities of the disc and of the region between the latter and the macula may be explained. The changes at the macula are secondary. Since the normal development of the temporal half of the disc has been interfered with by an abnormal growth of retinal tissue, this part of the disc has become colobomatous. This coloboma is an atypical one. Three illustrations.

D. F. H.

Halbertsma, K. T. A. Acute Hypotony in Detachment of Retina. Klin. M. f. Augenh., 1926, v. 76, p. 86.

A woman, aged 39, with myopia of —6, in the fourth week of pregnancy showed a recent detachment of the retina of the right eye without visible rupture. A few days later the anterior chamber was very deep funnel shaped. The bluish grey iris was discolored to grass green and was tremulous as was the lens. There was moderate pericorneal injection. The detachment was much larger, the vitreous more opaque and tension markedly low. There was no pain. At the macular region was an old chorioretinitic focus. After a few weeks the lower temporal portion of the retina was reattached but not the nasal portion, the iris had lost its green color, the anterior chamber was normal, the opacities of the vitreous had disappeared and tension was 16 mm. Hg. A slight hemorrhage at the inner side of the retina and the transient green dis-

coloration of the iris suggested an intraocular hemorrhage (subretinal). Thus the case showed that an intraocular hemorrhage with great hypotension, with a partial reattachment of the retina, occurred in the same eye.

C. Z.

Abramowicz, I. Bitemporal Contraction of the Visual Field in Pregnancy. Brit. J. of Ophthal. 1927, v. 11, p. 17.

This investigator introduces the subject of his investigations by discussing the views and observations held by others, together with a historic sketch. He describes his technic in making use of Forster's perimeter—the illumination, avoiding of fatigue and the use of Troncoso's method of recording results. Contractions of 5° or less were considered physiologic.

Eighty-one patients in the last month of pregnancy afford the basis for his observations. In cases in which he found contractions, further investigations on the ninth day after delivery were made.

Forty-six of these persons were primiparae; 19 were in their second pregnancy; 10 in their third pregnancy; 2 in their fourth; 3 in their fifth; and one was in her twenty-third pregnancy. These women were of good intelligence and between 19 and 43 years of age.

The results of these investigations showed five cases with slight temporal contractions of the visual fields; twice in primiparae; once in second pregnancy, and twice in the third pregnancy. The visual fields returned to normal after delivery. The contractions observed in these five cases might be considered as a sign of fatigue of the eye, or as a stigma hystericum, which occurs as well as other hysterical manifestations in the last period of pregnancy.

The author concludes that, (1) the manner of clinical investigations of the visual field at present in use, being a subjective method, is therefore affected by numerous physical defects and errors (illumination, color tests, the contrast and the size of the object) which must be taken into account in the interpretation of the results.

(2) In a few cases of normal pregnancy (6%) there occurs in the last month of pregnancy a slight temporal contraction of the visual field, which may be occasioned by the hypertrophy of the pituitary body.

(3) On the tenth day after delivery the visual field returns to its normal state.

(4) He observed no relation between the appearance and extent of the field contractions and the strength of the labor pains. D. F. H.

Rosenstein, A. M. Retrobulbar Neuritis. Klin. M. f. Augenh., 1926, v. 76, p. 94.

In a girl, aged 9, who had severe diphtheria, there occurred suddenly in the fourth week of convalescence, retrobulbar neuritis with central scotoma and bilateral ophthalmoplegia and paralysis of the muscles of the palate developing progressively within a fortnight. After four weeks these symptoms subsided under vaccines and sodium salicylate, leaving paralysis of accommodation for ten days and permanent palor of the temporal half of the discs, tortuosity of some veins and vision of 6/12. Optic neuritis after diphtheria is very rare and seems to give a good prognosis. C. Z.

Wadjid Ali Khan. Pedigree of Lamellar Cataract. Brit. J. of Ophthal. 1926, July, v. 10, pp. 387-389.

This is a record of a grandmother, two sons and a sister, the sister being the mother of the patient whose history is discussed. The pedigree does not measure up fully to the Mendelian theory. D. F. H.

Hamburger, C. The Strongest Miotic. Klin. M. f. Augenh., 1926, v. 76, p. 849.

The strongest miotic known to Hamburger is an amin of complicated chemical structure called histamin (amin-glaucosan) a white powder readily soluble in water 1/1000 solution. One drop of a sufficiently concentrated solution (up to 10%) produces in from 7 to 15 minutes, miosis of pupils which had been dilated by

atropin and scopolamin. It causes congestion of the head, redness and swelling of the conjunctiva and lids, and if not carefully applied may cause vertigo from lowered blood pressure. Two cases of glaucoma are reported in which the effect was very satisfactory so that a further careful test is recommended. C. Z.

Kranz, H. W. Monocular Paralysis of Sphincter Iridis in Conjunctival Lues. Klin. M. f. Augenh., 1926, v. 76, p. 670.

Cases in a boy, aged 5, and a woman, aged 30, are reported. The boy had no other symptoms. The woman showed typical saddle nose, parenchymatous keratitis and deafness. Wassermann reaction was negative but became positive after provocatory injection of 0.075 neosalvarsan. Before provocation the new modification of Wassermann reaction by Gotschlich was positive in the first case. In both cases there was absolute immobility of the right pupil with perfectly intact accommodation. Most likely the affection was due to a lesion in the right nuclear region of the third nerve where the centers of accommodation and sphincter are separated. C. Z.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply news from their respective sections: Dr. H. Alexander Brown, San Francisco; Dr. Wm. Thornwall Davis, Washington; Dr. Gaylord C. Hall. Louisville, Ky.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. George H. Kress, Los Angeles; Dr. Edward D. LeCompte, Salt Lake City; Dr. W. H. Lowell, Boston; Dr. G. Oram Ring. Philadelphia; Dr. Charles P. Small, Chicago; Dr. G. McD. VanPoole, Honolulu.

DEATHS.

Ira Jesse Dunn, Erie, Pa., aged 63, died March 9, 1927, of heart disease.

Richard Jones Phillips, aged 65, of Upper Darby, Pa., died March 30, 1927.

Professor Wilhelm Uhthoff, formerly Director of the Ophthalmic Clinic at Breslau, died recently, aged 74.

SOCIETIES.

At the April meeting of the Kansas City Eye, Ear, Nose and Throat Society the following officers were elected for the coming year: President, Dr. A. J. Lorie; Vice-Presidents, Drs. T. S. Blakesley and W. G. Patton; Secretary, Dr. A. E. Eubank; Treasurer, Dr. E. E. Pickens.

The regular April meeting of the Omaha and Council Bluffs Ophthalmological and Oto-Laryngological Society was held April 19th, 1927, at Council Bluffs. Dr. A. R. Knobe, Chairman. Drs. Howard and Dean presented several ear cases. Dr. George F. Suker of Chicago gave (by invitation) a talk on the Anatomy of the Optic Chiasm and some of its Diseases. The talk was well illustrated by charts, wet specimens and x-ray and clinical photographs.

At the Section on Ophthalmology of the College of Physicians of Philadelphia held April 21, 1927, the following program was given: Dr. Walter J. Sener (by invitation), "Exhibition of a Case of Cerulean Cataract." Exhibition of a Case of Albinism. Dr. E. B. Miller: "Before and After Cataract." Dr. B. Alexander Randall: "Iridectomy as Viewed by the Pathologic-Anatomist." Lantern slides. Dr. Burton Chance: "Richard Bright." An Ophthalmologist's Appreciation. Dr. E. B. Spaeth (by invitation): "The Correction of Gross Ophthalmic Defects by Plastic Surgery." Lantern slides.

The Ophthalmological and Oto-Laryngological Section of the Houston Academy of Medicine held a most interesting meeting on April 3rd. The following cases were reported. "Cyst of the Anterior Chamber," Dr. E. L. Goar. "Ivory Implantation in Ozena," Dr. Louis Daily. "Tracheo-Oesophageal Fistula Result of Lye Burn," Dr. C. C. Cody. "A Case of Herpes Zoster Ophthalmicus in an Adult," Dr. S. T. Pulliam. The guest of the evening, Dr. Harry S. Gradle, of Chicago, gave a very instructive address, "Some of the Modern Aspects of the Diagnosis and Treatment of Glaucoma." The section gave a luncheon for Dr. Gradle at noon. The officers of the section are Dr. Ray K. Daily, President; Dr. J. Gambler, Vice-President; and Dr. L. Raney, Secretary-Treasurer.

The one hundred and thirty-ninth regular meeting of the Ophthalmological and Oto-Laryngological Section of the Cleveland Academy of Medicine was held March 25, 1927. Dr. Urban D. Seidal read a paper on "Non-Specific Therapy of Ocular Diseases." He considered the results of various authors since the inception of this mode of treatment, and, from their results as well as his own, reached the conclusion that milk injections are beneficial in inflammatory involvements of the anterior segment. Vaccine therapy has no advantage over milk except in tuberculosis. Dr. Louis E. Brown spoke on "Gastro-Intestinal

Involvement Complicating Acute Suppurative Mastoiditis," with case reports. He cited several instances where gastrointestinal symptoms were secondary to a mastoiditis, the aural symptoms becoming overshadowed by that former, the only local sign being a loss of luster of the tympanic membrane. His conclusion was that these cases were metastatic and this was borne out by autopsy in two cases.

Dr. William Evans Bruner, professor of Ophthalmology in the School of Medicine of Western Reserve University, addressed the American College of Physicians, at its Eleventh Annual Clinical Session, held in Cleveland recently. Dr. Bruner spoke on "The Eyegrounds in General Diagnosis." Dr. A. D. Ruedemann, of the Cleveland Clinic also addressed the Congress, taking as his subject "The Fundus in Diabetes."

PERSONAL.

Dr. J. F. Smith of San Francisco, California, is having a short rest in Honolulu.

Dr. G. M. Van Poole, Honolulu, recently returned from a trip to Vienna.

Dr. J. A. Morgan, Honolulu, is spending a few weeks in the states.

Dr. S. D. Shortlidge of San Francisco, California, is spending a short vacation in Honolulu.

Dr. Edgar F. Conant, Denver, announces that he has removed his offices to the Republic Building.

Dr. Harry Vanderbilt Wurdemann of Seattle was the guest of the Oregon Academy of Ophthalmology and Oto-Laryngology in Portland, April 18th, addressing the meeting on "The Relations of Cupping of the Optic Disc to the Visual Fields in Glaucoma."

Dr. Thomas B. Holloway and Dr. William Zentmayer of Philadelphia will sail for Europe in July for a visit to the Pyrennees, the French Riviera and Italy.

Dr. and Mrs. G. Oram Ring of Philadelphia will sail for Europe early in July for an auto trip thru the hill towns of Italy, preceding which Dr. Ring will visit Professor Elschnig's Clinic in Prague.

Dr. Frances H. Adler of Philadelphia recently sailed for Europe with Mrs. Adler, to remain for several months. During his absence Dr. Adler contemplates visiting the eye clinics of Vienna, Budapest, Breslau and Prague.

Professor Karl Lindner has been appointed Director of Eye Clinic II of Vienna. This is the Clinic of which Professor E. Fuchs was director and which came to be known as the Fuchs Clinic. Prof. Lindner was first assistant to Prof. Fuchs up to the time of his retirement at the age of 70 in 1921. Prof. Lindner has been, among the English speaking teachers of ophthalmology in Vienna, one of the most popular with the American students; and his promotion to "Vorstand" of this Clinic will help to keep up interest which American ophthalmologists feel in Vienna as a center for teaching of ophthalmology.

Dr. Charles E. G. Shannon of Philadelphia has been elected Professor of Ophthalmology by the trustees of Jefferson Medical College to succeed the late Dr. Wm. M. Sweet. Dr. Shannon has been actively identified with the Ophthalmological department of Jefferson, since 1905, more especially in association with Dr. Howard F. Hansell, who is now Emeritus Professor of Ophthalmology. Previous to beginning his special work in 1905 at Jefferson College, Dr. Shannon had taken a postgraduate course at the Massachusetts Eye and Ear Infirmary.

Dr. Howard F. Hansell, Emeritus Professor of Ophthalmology of Jefferson Medical College, Philadelphia, was tendered a complimentary dinner at the Union League on Wednesday evening, April the twentieth by the Ophthalmic Staff of the College. The personal tributes of devotion voiced by the participants touched Dr. Hansell very deeply. Dr. G. Oram Ring as a personal friend of Dr. Hansell's was honored by an invitation to the dinner and presented him in behalf of the staff with a handsome Malacca cane, to which Dr. Hansell made an appropriate response. Dr. and Mrs. Hansell will sail early in May for Europe to remain until October.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in *heavy-faced type*. The abbreviations mean: (Ill.) illustrated; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper.

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